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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 09/862,688
Filing Date: May 22, 2001
Applicant: D. Mauer et al.
Group Art Unit: 3726
Examiner: E. Omgba
Title: RIVETING SYSTEM AND PROCESS FOR FORMING A
RIVETED JOINT
Attorney Docket: 0275M-000260/DVB

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

RESPONSE TO THIRD NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF

A "Third Resubmission of Appeal Brief" is being filed in response to the third Notification of Non-Compliant Appeal Brief dated January 4, 2007. The Examiner's basis for the Notification is respectfully traversed. It is believed that the previously filed Resubmission of Appellant's Second Appeal Brief was fully compliant. Notwithstanding, the Third Resubmission of Appeal Brief has been revised in light of the Supervisory Patent Examiner's telephonic format suggestions.

Respectfully submitted,

Dated: 5 FEB 2007

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THIRD RESUBMISSION OF APPEAL BRIEF



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This Appeal was filed under 37 C.F.R. §1.192 from the Final Rejection of Claims 12, 15, 16 and 18-77, as provided in the Final Office Action dated November 18, 2004 and Advisory Action dated January 26, 2005. The Notice of Appeal was filed by mail on February 18, 2005. This Brief contains all of the items required by 37 C.F.R. §41.37.

I. REAL PARTY IN INTEREST

The owner of the present patent application is Newfrey LLC by way of an assignment recorded on November 26, 2002 at reel/frame 013516/0757. It was previously assigned to Emhart LLC from Emhart Inc. by an assignment recorded on April 18, 2002, at reel/frame 013036/0919; and before that to Emhart Inc., by way of an Assignment from the inventors recorded on January 31, 2000, at reel/frame 010560/0045.

Emhart LLC, Emhart Inc., Black & Decker Corp., Emhart Fastening Technologies and Emhart Tucker, GmbH are companies related by ownership with Newfrey LLC.

II. RELATED APPEALS AND INTERFERENCES

No related appeals, interferences or judicial proceedings are presently pending or have been decided for the present application or U.S. applications related thereto by a claim of priority. However, a negative EPO Opposition Decision of 16 March 2006 for an equivalent case to the German priority application is enclosed. It is

noteworthy that the opposition claims were very different than those presently on appeal herein.

III. STATUS OF CLAIMS

Claims 1-11 have been allowed, Claims 13, 14 and 17 have been objected to and Claims 12, 15, 16 and 18-77 stand finally rejected and are the subject of this Appeal. A clean copy of the amended claims involved in the Appeal is attached hereto in Appendix A.

IV. STATUS OF AMENDMENTS

An Amendment After Final was filed on January 5, 2005 responsive to a second Final Office Action dated November 18, 2004. The Amendment After Final was entered in the Advisory Action dated January 26, 2005. All of the amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

12. A riveting electrical control system comprising:
 - (a) an electrical control unit (**ref. no. 25, page 7 line 3 of para. [0029], Fig. 1);**
 - (b) an electric motor (**ref. nos. 29 and 401, page 7 line 5 of para. [0029], page 13 line 2 of para. [0042], Figs. 6 and 9)** connected to the electrical control unit;

(c) a fluid-free transmission operably driven by energization of the electric motor (ref. nos. 51, 53 and 403, page 7 lines 1 and 2 of para. [0030], page 13 line 3 of para. [0042], Figs. 6 and 9);

(d) a riveting punch (ref. nos. 31 and 404, page 7 line 2 of para. [0030], page 14 line 10 of para. [0044], Figs. 6 and 9) operably advanced by the transmission; and

(e) a sensor (ref. nos. 103, 201, 205 and 211, page 8 lines 5-11 of para. [0033], page 10 lines 1-18 of para. [0037], page 15 lines 2-10 of para. [0046], Figs. 6 and 15) connected to the electrical control unit, the sensor being operable to sense riveting force.

22. A riveting electrical control system comprising:

(a) an electrical control unit (ref. no. 25, page 7 line 3 of para. [0029], Fig. 1)

(b) an electric motor (ref. nos. 29 and 401, page 7 line 5 of para. [0029], page 13 line 2 of para. [0042], Figs. 6 and 9) connected to the electrical control unit;

(c) a transmission (ref. nos. 51, 53 and 402, page 7 lines 1 and 2 of para. [0030], page 13 line 5 of para. [0042], Figs. 6 and 9) operably driven by energization of the electric motor, the transmission operably converting rotational movement of the electric motor to substantially linear movement;

(d) a riveting punch (ref. nos. 31 and 404, page 7 line 2 of para. [0030], page 14 line 10 of para. [0044], Figs. 6 and 9) operably advanced in a substantially linear direction by the transmission;

(e) a self-piercing rivet (ref. no. 261, page 11 line 7 of para. [0038], page 14 lines 1-5 of para. [0045], Figs. 8 and 13) operably driven by the punch as controlled by the electrical control unit; and

(f) a die (ref. nos. 35 and 406, page 7 lines 5 and 6 of para. [0029], page 14 line 17 of para. [0044]) operably diverging an end of the rivet without the rivet piercing completely through the exterior surface of a die-side workpiece adjacent the die;

the electric control unit operably controlling energization of the electric motor and operably determining if an undesired riveting condition is present.

34. A control system comprising:

(a) a programmable control unit (ref. no. 25, page 7 line 3 of para. [0029], Fig. 1);

(b) a riveting machine including an electric motor and a transmission operable to convert rotary motion of the electric motor to linear motion of a punch (ref. nos. 29 and 401, page 7 line 5 of para. [0029], page 13 line 2 of para. [0042], Figs. 6 and 9, ref. nos. 51, 53 and 402, page 7 lines 1 and 2 of para. [0030], page 13 line 3 of para. [0042], Figs. 6 and 9, ref. nos. 31 and 404, page 7 line 2 of para. [0030], page 14 line 10 of para. [0044], Fig. 6 and 9);

(c) a self piercing rivet (ref. no. 261, page 11 line 7 of para. [0038], page 14 lines 1-5 of para. [0045], Figs. 8 and 13) operably set by the punch acting

with a substantially relatively stationary die of the riveting machine when the control unit causes energization of the electric motor; and

(d) a feeder (**ref. no. 27, page 7 line 3 of para. [0029], Figs. 2 and 11**) operable to transfer the rivet to the riveting machine.

43. A control system comprising:

(a) a programmable controller (**ref. no. 25, page 7 line 3 of para. [0029], Fig. 1**);

(b) a riveting machine including an electric motor and a transmission always coupled to the electric motor during motor actuation, the transmission being operable to convert rotary motion of the electric motor to substantially linear motion (**ref. nos. 29 and 401, page 7 line 5 of para. [0029], page 13 line 2 of para. [0042], Figs. 6 and 9, ref. nos. 51, 53 and 402, page 7 lines 1 and 2 of para. [0030], page 13 line 3 of para. [0042], Figs. 6 and 9, ref. nos. 31 and 404, page 7 line 2 of para. [0030], page 14 line 10 of para. [0044], Fig. 6 and 9**);

(c) a rivet (**ref. no. 261, page 11 line 7 of para. [0038], page 14 lines 1-5 of para. [0045], Figs. 8 and 13**) operably moved by the riveting machine when the controller causes energization of the electric motor, the rivet being of a hollow and diverging type with a solid head; and

(d) a sensor (**ref. no. 211, page 10 lines 1-18 of para. [0037], page 15 lines 2-10 of para. [0046], Fig. 15**) operable to indicate power consumption of the electric motor, the controller operably receiving a signal generated by the sensor.

48. A control system comprising:

(a) a programmable controller (**ref. no. 25, page 7 line 3 of para. [0029], Fig. 1**);

(b) a riveting machine including an electric motor and a transmission, the transmission being operable to convert rotary motion of the electric motor to linear motor, a section of the electric motor being rotatable about an axis offset from a centerline coaxial with an elongated dimension of the punch (**ref. nos. 29 and 401, page 7 line 5 of para. [0029], page 13 line 2 of para. [0042], Figs. 6 and 9, ref. nos. 51, 53 and 402, page 7 lines 1 and 2 of para. [0030], page 13 line 3 of para. [0042], Figs. 6 and 9, ref. nos. 31 and 404, page 7 line 2 of para. [0030], page 14 line 10 of para. [0044], Fig. 6 and 9**);

(c) a rivet (**ref. no. 261, page line 7 of 11 para. [0038], page 14 lines 1-5 of para. [0045], Figs. 8 and 13**) operably moved by the riveting machine when the controller causes energization of the electric motor;

(d) a sensor (**ref. nos. 103, 201, 205 and 211, page 8 lines 5-11 of para. [0033], page 10 lines 1-18 of para. [0037], page 15 lines 2-10 of para. [0046], Figs. 6 and 15**) operable to indicate a riveting force characteristic, the controller operably receiving a signal generated by the sensor;

(e) an articulating robot (**page 7 line 8 of para. [0029], Fig. 2**), the riveting machine being attached to and positioned by the robot; and

(f) a rivet feeder (**ref. no. 27, page 7 line 3 of para. [0029], Figs. 2 and 11**) connected to the riveting machine, the controller operably controlling actuation of the rivet feeder.

50. A riveting electrical control system comprising:

(a) an electrical control unit (ref. no. 25, page 7 line 3 of para. [0029],

Fig. 1);

(b) an electric motor (ref. nos. 29 and 401, page 7 line 5 of para. [0029], page 13 line 2 of para. [0042], Figs. 6 and 9) connected to the electrical control unit;

(c) a fluid-free mechanical transmission operably converting rotational movement of the electric motor to substantially linear movement, the transmission being coupled to the electric motor during motor use (ref. nos. 51, 53 and 402, page 7 lines 1 and 2 of para. [0030], page 13 line 3 of para. [0042], Figs. 6 and 9);

(d) a rivet setting punch (ref. nos. 31 and 404, page 7 line 2 of para. [0030], page 14 line 10 of para. [0044], Figs. 6 and 9) operably advanced by the transmission;

(e) a substantially stationary die (ref. nos. 35 and 406, page 7 lines 5 and 6 of para. [0029], page 14 line 17 of para. [0044]) always aligned with the punch; and

(f) the electrical control unit operably determining if a riveted joint is within a desired range (page 16 para. [0049] – page 18 para. [0053], page 20 para. [0057] – page 23 para. [0062], Figs. 17 and 18).

56. A riveting system comprising:

an electric motor (ref. nos. 29 and 401, page 7 line 5 of para. [0029], page 13 line 2 of para. [0042], Figs. 6 and 9);

a rotatable member (ref. nos. 73, 79, 81, 411, 412 and 414, page 8 para. [0031] and [0032], page 13 para. [0043], Figs. 6 and 9) operably driven by energization of the motor;

a transmission (ref. nos. 51, 53 and 402, page 7 lines 1 and 2 of para. [0030], page 13 line 3 of para. [0042], Figs. 6 and 9) serving to convert rotary motion of the rotatable member to linear motion;

a plunger (ref. nos. 31 and 404, page 7 line 2 of para. [0030], page 14 line 10 of para. [0044], Figs. 6 and 9) coupled to the transmission and being movable in a linear direction;

a self piercing rivet (ref. no. 261, page 11 line 7 of para. [0038], page 14 lines 1-5 of para. [0045], Figs. 8 and 15) operably driven by the plunger, the rivet being at least partially hollow; and

a data monitoring unit (ref. no. 25, page 7 line 3 of para. [0029], Fig. 1) electrically connected to at least one of: (a) the motor, and (b) the transmission.

63. A riveting system comprising:

an electric motor (ref. nos. 29 and 401, page 7 line 5 of para. [0029], page 13 line 2 of para. [0042], Figs. 6 and 9);

a transmission (ref. nos. 51, 53 and 402, page 7 lines 1 and 2 of para. [0030], page 13 line 3 of para. [0042], Figs. 6 and 9) serving to convert rotary motion of the motor to linear motion;

a member (ref. nos. 31 and 404, page 7 line 2 of para. [0030], page 14 line 10 of para. [0044], Figs. 6 and 9) coupled to the transmission and being movable in a linear direction;

a self piercing rivet (ref. no. 261, page 11 line 7 of para. [0038], page 14 lines 1-5 of para. [0045], Figs. 8 and 15) operably driven by the member;

a linearly movable workpiece clamp (ref. nos. 33 and 405, page 7 line 5 of para. [0029], page 14 line 16 of para. [0044], Figs. 1 and 9) coupled to the transmission;

the motor having a rotational axis offset from an elongated centerline of the member and the rotational axis of the motor being substantially parallel to the centerline of the member (Figs. 3, 6 and 9); and

a member-side workpiece and a die-side workpiece (ref. nos. 407, 408, 501, 503, page 14 line 16 of para. [0044], page 18 line 6 of para. [0053], Figs. 9 and 12), the rivet completely piercing the member-side workpiece but being prevented from completely piercing the die-side workpiece;

the member and clamp being initially movable together at a first speed during advancing movement, and the plunger being subsequently movable at a second speed slower than the first speed when the clamp is substantially stationary during rivet-to-workpiece engagement (pages 15 and 16 para. [0047]).

71. A riveting control system comprising:

(a) an electric motor (ref. nos. 29 and 401, page 7 line 5 of para. [0029], page 13 line 2 of para. [0042], Figs. 6 and 9);

(b) a transmission (ref. nos. 51, 53 and 402, page 7 lines 1 and 2 of para. [0030], page 13 line 3 of para. [0042], Figs. 6 and 9) operably converting rotary motion of the motor to linear motion;

(c) a plunger (ref. nos. 31 and 404, page 7 line 2 of para. [0030], page 14 line 10 of para. [0044], Figs. 6 and 9) coupled to the transmission and being movable in a linear direction;

(d) a rivet (ref. no. 261, page 11 line 7 of para. [0038], page 14 lines 1-5 of para. [0045], Figs. 8 and 15) operably advanced by the plunger; and

(e) a data monitoring unit (ref. no. 25, page 7 line 3 of para. [0029], Fig. 1) operably comparing a characteristic indicative of an actual riveted joint condition to a previously stored value, the monitoring unit operably determining whether a portion of the rivet is flush with a workpiece surface (page 18 para. [0052]).

VI. GROUNDS OF REJECTIONS TO BE REVIEWED ON APPEAL

The issues are as follows: (A) Claims 12, 15, 20, 21, 50 and 54 stand rejected under 35 U.S.C. §103 (a) as allegedly being unpatentable over Speller (U.S. Patent No. 5,829,115) in view of IBEC (Body Assembly & Manufacturing, September 1994); (B) Claims 51 and 52 stand rejected under 35 U.S.C. §103 (a) as allegedly being unpatentable over Speller, IBEC and Gast (U.S. Patent No. 4,901,431); (C) Claim 16 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller IBEC and Zeldman et al. (U.S. Patent No. 3,878,734); (D) Claims 22-30, 33, 34, 43, 44, 56, 57 and 59-61 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller in view of Cotterill (U.S. Patent No. 5,752,305); (E) Claims 31, 32, 35-42 and 45-47 stand rejected under 35 U.S.C. §103(a) as allegedly being

unpatentable over Speller, Cotterill and Gast; (F) Claim 48 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, in view of IBEC and Gast; (G) Claims 49 and 55 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, IBEC, Gast and Cotterill et al.; (H) Claim 58 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Cotterill and the Affidavit of John Vrana; (I) Claim 62 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Cotterill, IBEC and Gast; (J) Claims 63 and 71 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Cotterill and Vrana; and (K) Claims 64-77 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Cotterill, Vrana and IBEC.

VII. ARGUMENT

A. Legal Errors by Examiner re: Declarations and License Demonstrating Secondary Considerations, Applicable to Most Claims

Three Declarations and a license relevant to the present application have been filed and are attached in Appendix B. The Examiner, however, has not given these evidentiary items their proper weight, if any at all.

“A prima facie case of nexus is generally made out when the patentee shows both that there is commercial success, and that the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent. When the thing that is commercially successful is not coextensive with the patented invention – for example, if the patented invention is only a component of a commercially successful machine or process – the patentee must show prima facie a legally sufficient relationship between that which is patented and that which is sold.” *Demaco Corp. v. F.*

Von Langsdorff Licensing Ltd., 7 U.S.P.Q.2d 1222, 1226 (Fed. Cir. 1988). The Examiner can only rebut this prima facie case of nexus with tangible evidence that the commercial success was due to extraneous factors other than the patented invention such that the Examiner's mere argument and conjecture are insufficient. *See, Id.* at 1226-27. Furthermore, a "patentee is not required to prove as part of its prima facie case that the commercial success of the patented invention is *not* due to factors other than the patented invention." *Id.* at 1227. "When a prima facie case is made and not fully rebutted, the . . . [patent office] may not totally ignore the objective evidence." *Id.* (emphasis added).

More specifically, the Declaration of Dieter Mauer (an inventor of the present application) was originally filed in a related application (with similar claims) and is of record in the present application. This Mauer Declaration specified in paragraph 3 that the rivet machines sold to Audi contained the mechanical features presently disclosed in the present claims in dispute. The last sentence of paragraph 4 of the same declaration also states "[it] is further my understanding that Audi found the process data monitoring, sensing and controllability for the Emhart Tucker rivet machines to be technically desirable and superior to competitive rivet machines." This indicates that the rivet machines sold to Audi also had the sensing and control features presently claimed. The control, electric motor, sensor and rotary-to-linear transmission features of the Audi machines are also well documented in the third party, Audi employee declaration of H. Konig paragraphs 3 and 7, thus demonstrating the requisite nexus.

Moreover, the technical basis for these machine acquisitions is significantly supported by paragraph 6 of the Audi employee Konig declaration. Similarly, section 4 of the Mauer Declaration clarifies that Audi purchased these rivet machines "primarily based on their technical merit rather than sales, marketing, advertising or price considerations." In contrast, the Examiner's case citations and arguments are distinguishable from the present facts and the Examiner's application of these cases were overly superficial. Accordingly, the proper nexus between the commercial success and claimed invention has been proven.

The Examiner also improperly dismissed the declarations by requiring market share information. "Although sales figures coupled with market data provides stronger evidence of commercial success, sales figures alone are also evidence of commercial success." *Tec Air Inc. v. Denso Mfg. Michigan Inc.*, 52 U.S.P.Q.2d 1294, 1299 (Fed. Cir. 1999). This Federal Circuit case should be given more precedential value than the Board of Patent Appeals and Interferences case cited by the Examiner. Notwithstanding, it is believed that Applicants' company, Emhart Tucker GmbH, is one of at least three significant suppliers of related machinery in Europe and the present invention was first presented to customers around 1998 or 1999.

Nevertheless, the subsequent Declaration by assignee's product manager, Ralf England, (filed in the present application on December 12, 2002) overcomes the inadequacies improperly alleged by the Examiner. It ties the commercial success to the claims in the present application as they were pending at that time (with Claims 22, 34 and 48 being unchanged and the others having been broader at that time) and it discusses the market share issue. Furthermore, Sections 3.1 and 3.2 of the

redacted SPR Setting Machine Usage Agreement with the Edison Welding Institute (hereinafter “the EWI License”, filed in the present application on January 29, 2004), is a license and states that “the product covered by all of the claims of the Licensed Patents [including the present application] has exhibited commercial success, is valuable and is a significant improvement in the industry.” The claims pending on the execution date of the EWI License of January 15, 2004, have not changed except for Claims 31, 50 and 54-77. Accordingly, the Examiner legally erred by not properly considering the declarations and license filed in the present application as to commercial success, licensing, significant improvement in the industry and, thus, nonobviousness.

B. Legal Error by Examiner Re: No Suggestion or Motivation to Combine References

The presently claimed combination of elements in all of the claims is new and nonobvious. “Virtually all inventions are combinations of old elements” such that “rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be an illogical and inappropriate process by which to determine patentability.” *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Furthermore, the references applied by the Examiner do not contain the requisite suggestion or motivation necessary to show obviousness of the claimed invention. *See, Smith Indus. Medical Sys. Inc. v. Vital Signs Inc.*, 51 U.S.P.Q.2d 1415, 1420-21 (Fed. Cir. 1999); *see also, Akamai Technologies Inc. v. Cable & Wireless Internet Services Inc.*, 68

U.S.P.Q.2d 1186, 1193 (Fed. Cir. 2003). There is also a lack of motivation for the combination of the cited references suggested by the Examiner. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992).

U.S. Patent Publication No. 2002/0166221 (Clew) provides additional evidentiary support that there is no suggestion or motivation to combine the cited hydraulically actuated riveting machines, such as IBEC, with the electric motor actuated device of Speller to arrive at the presently claimed invention. The differences and incompatibility of these prior devices are significant. See, for example, Paragraph Nos. [0004], [0005] and [0012] of Clew, where German Application No. EP 0893172, which is the priority basis for the present application, is compared to U.S. Patent No. 5,752,305 (Cotterill). It is also noteworthy that the assignee of Clew is the assignee of Cotterill and is the Henrob Company referenced in the IBEC publication. Furthermore, Clew is not prior art to the present application. Thereby, not only is there a lack of suggestion or motivation in the prior art to combine the cited references, but some of the references teach away from the alleged combination.

C. Legal Error by Examiner Re: Improper Hindsight Analysis

"Care must be taken to avoid hindsight reconstruction by using the patent-in-suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit." *Grain Processing Corp. v. American Maize-Prods. Co.*, 5 U.S.P.Q.2d 1788, 1792 (inner

quotes omitted); *see also*, *Cardiac Pacemakers Inc. v. St. Jude Medical Inc.*, 72 U.S.P.Q.2d 1333, 1336 (Fed. Cir. 2004). The Examiner should not “pick and choose among the individual elements of assorted prior art references to recreate the claimed invention.” *Symbol Technologies Inc. v. Opticon Inc.*, 19 U.S.P.Q.2d 1241, 1246 (Fed. Cir. 1991); *see also*, *In re Wesslau*, 147 U.S.P.Q. 391, 393 (C.C.P.A. 1965). “The prior art as a whole” must “suggest the desirability, and thus the obviousness, of making the combination” of known elements. *Ecolochem Inc. v. Southern California Edison Co.*, 56 U.S.P.Q.2d 1065, 1073 (Fed. Cir. 2000). The Examiner must identify the explicit statements in the prior art that demonstrate the alleged motivation, suggestion or teaching, and broad “conclusory statements standing alone are not ‘evidence’.” *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000; *see also*, *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). In this regard, the Examiner has respectfully failed.

D. 35 U.S.C. §103 Rejection of Claims 12, 15, 20, 21, 50 and 54

The Examiner has rejected Claims 12, 15, 20, 21, 50 and 54 under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al. (U.S. Patent No. 5,829,115) and IBEC (Body Assembly & Manufacturing, September 1994). This rejection is respectfully traversed. It is believed that the originally filed claims are patentably distinct over the cited references.

1. Scope, Content and Differences of Prior Art

Under 35 U.S.C. §103, “the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.” *Graham v. John Deere Co.*, 148 U.S.P.Q. 459, 467 (U.S. 1966). In the Final Office Action, the Examiner has misstated (a) the scope and content of all of the cited references and (b) the Examiner has incorrectly analyzed the similarity and differences between all of the cited references as compared to the claimed invention.

2. Level of One Skilled in Art

The level of one of ordinary skill in the art of the present application would be a person with a mechanical engineering degree and about five years of experience in the design of riveting machines, or the equivalent practical experience. This skilled artisan would also need to have some exposure to high volume riveting of metal panels in a manufacturing plant, such as an automotive assembly plant.

3. Legal and Factual Errors by Examiner

Independent Claim 12 had previously been amended to state that a fluid-free (e.g., not hydraulic) transmission is driven by the electric motor. Support for this amendment can be found within Applicants’ originally filed Figures 6 and 9, as well as the accompanying text. This amendment further highlights the incompatibility, and lack of suggestion and motivation to combine the hydraulic system of IBEC with the electric

motor actuator of Speller. Clew and the many secondary considerations provide ample evidence of nonobviousness of the presently claimed invention.

Furthermore, independent Claim 50 had previously been amended to state that a fluid-free transmission is used which is coupled to the electric motor during normal motor use. In contrast, Speller teaches that “a single actuator 80 can thus be provided for operation of all the tools 180, 182, 184, 186, and 188” such that a riveting transmission is not always coupled to the motor. See column 7, lines 23-25, and Figure 9 of Speller. Radical reengineering would be required to combine the hydraulic drive of IBEC with the multi-tool system of Speller given the improper benefit of hindsight reasoning using the presently claimed invention as a template. Clew and the secondary considerations also teach away from this combination. The Examiner’s note alleging obvious matters of design choice with regard to the claimed stationary die being aligned with the punch in Claim 50 is respectfully challenged, as this claimed feature again highlights the extreme differences between Speller and the present invention.

The Examiner has ignored the secondary considerations of commercial success, licensing and industry significance as presented in the Declarations under 37 C.F.R. §1.132 by inventor D. Mauer, assignee's product manager Ralf England, customer H. Konig of Audi and the EWI License. These Declarations and especially the EWI License are clear that the commercial success and significance in the industry are primarily based on the technical merit of the claimed invention. These Declarations and the EWI License must be given their proper objective and significant weight to defeat obviousness. See, *Stratoflex, Inc. v. Aeroquip Corp.*, 218 U.S.P.Q. 871, 880 (Fed. Cir. 1983 (secondary considerations must always . . . be considered”); see also, *Truswal*

Sys. Corp. v. Hydro-Air Eng'g. Inc., 2 U.S.P.Q.2d 1034, 1039 (Fed. Cir. 1987) (“secondary in time does not mean that it is secondary in importance”).

None of the references cited by the Examiner disclose all of the above mentioned features, nor is there a suggestion or motivation to combine the cited references, and therefore, the claims at issue are patentably distinct over the cited references. In contrast to the Examiner's incorrect assertions, there is no suggestion or motivation to combine the electrically driven machine of Speller with the hydraulically actuated machine of the IBEC reference. To the contrary, the third party, Audi employee declaration of Konig states, in paragraph 6, that the electric motor driven, rotary-to-linear transmission, with sensor control “technology here employed is not to our knowledge usable for other, e.g., hydraulic, systems.” (emphasis added). This is the statement from a third party customer, Audi, who was comparing a hydraulically driven self piercing riveting machine to the Emhart Tucker riveting machine disclosed and claimed in the present application.

Moreover, Speller, at column 1, lines 20-27, and in column 2, lines 11-18, teaches away from and discourages the use of hydraulics for riveting machines. See generally, Winner Int'l Royalty Corp. v. Wang, 53 U.S.P.Q.2d 1580, 1588 (Fed. Cir. 2000), *cert. denied*, 530 U.S. 1238 (Fed. Cir. 2000 (if a reference teaches away then that fact alone can defeat obviousness)). Significant reengineering would be required to combine these two cited devices if that is even possible; it would clearly not be desirable given the background of the Speller patent and statement of the Audi employee. This is even more significant given that the Speller patent is primarily intended for use to upset a two sided rivet adjacent the anvil 50 and not actually to

receive and drive the rivet itself into a workpiece (see column 4, lines 4-8 of the '115 patent).

As further evidence of secondary considerations supporting nonobviousness, Ekdahl et al. (U.S. Patent No. 5,727,300) explains, throughout columns 1 and 2, that there is a long felt but unsolved need for real time rivet inspection, that is being solved by the present invention. It is noteworthy that both the Ekdahl and Speller patents pertain to the same aircraft riveting industry.

In the present situation, even if the cited references disclose the features incorrectly alleged by the Examiner, the suggestion or motivation to combine the disparate references to arrive at the elements as presently claimed, is severely lacking. The claimed invention has been improperly used as a template to combine these assorted and far flung elements, thereby requiring the Board to withdraw and overturn the instant rejection. The secondary considerations of commercial success, licensing, significance in the industry, long felt but unsolved need, and teaching away from by others require a finding of nonobviousness of the presently claimed invention.

4. Legal and Factual Errors by Examiner for Dependent Claims

The Examiner has made further factual errors with regard to the dependent claims. There is no teaching, suggestion or motivation by the cited references for the new and nonobvious combination of the present claim elements, especially when the additional elements of each of the dependent claims are considered. For example, none of the cited references specifically teach the additional feature of an electric motor torque sensor as claimed in dependent Claim 20. Additionally, none of the cited references specifically teach the flushness determination of dependent Claim 53. With all due respect, the Examiner is simply mistaken in his reading and application of the prior art, and lack of suggestion to combine same. Accordingly, it is respectfully requested that the Examiner's rejection should be reversed.

E. 35 U.S.C. §103 Rejection of Claims 51 and 52

Claims 51 and 52 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al. and IBEC in view of Gast (U.S. Patent No. 4,901,431). This rejection is respectfully traversed. All of the originally filed claims are believed to be patentably distinct over the cited references.

Furthermore, there is no suggestion or motivation for combining the cited references, especially since significant reengineering would be required to combine the hydraulic/pneumatic systems of IBEC and Gast with the screw drive system of Speller (which teaches away from such a combination (see column 1, lines 20-27 and column 2, lines 11-18, of Speller, and the background of Clew)). Notwithstanding, this rejection

is deemed moot in light of the base independent claims. Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

F. 35 U.S.C. §103(a) Rejection of Claim 16

Claim 16 has been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al. and IBEC in view of Zeldman et al. (U.S. Patent No. 3,878,734). This rejection is respectfully traversed. It is believed that the originally filed claim is patentably distinct over the cited references.

The suggestions for this combination are lacking and, moreover, the significant secondary considerations and the teachings away by Clew weigh in favor of nonobviousness. Notwithstanding, this rejection is deemed moot in light of the base independent claim. Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

G. 35 U.S.C. §103 Rejection of Claims 22-30, 33, 34, 43, 44, 56, 57 and 59-61

Claims 22-30, 33, 34, 43, 44, 56, 57 and 59-61 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al. in view of Cotterill et al. (U.S. Patent No. 5,752,305). This rejection is respectfully traversed. It is believed that the originally filed claims are patentably distinct over the references cited.

1. Legal and Factual Errors by the Examiner

Independent Claim 43 had previously been amended to state that the transmission is always coupled to the electric motor during normal motor actuation.

Support for this amendment can be found in originally filed Figures 6 and 9 as well as the accompanying text. Speller teaches a radically different construction as discussed in its column 7, lines 23-25.

In contrast to the Examiner's assertions, the presently claimed combination of elements in Claims 22-30, 33, 34, 43, 44, 56, 57 and 59-61 is new and nonobvious. None of the references cited by the Examiner disclose the above mentioned features, nor is there a suggestion or motivation to combine the cited references, and therefore, the claims at issue are patentably distinct over the cited references. The Examiner has improperly employed hindsight reconstruction by using the patent-in-suit as a template.

More specifically, there is no suggestion or motivation to combine the electrically driven machine of Speller with the hydraulically actuated machine of the Cotterill reference. To the contrary, the Audi third party, employee declaration of Konig states that in paragraph 6 that the "technology here employed is not to our knowledge usable for other, e.g., hydraulic, systems." (emphasis added). This is the statement from a third party customer, Audi, who was comparing a hydraulically driven self piercing riveting machine to the Emhart Tucker riveting machine disclosed and claimed in the present application.

Furthermore, Speller, at column 1, lines 20-27, and in column 2, lines 11-18, teaches away from and discourages the use of hydraulics for riveting machines. See generally, *Winner Int'l Royalty Corp. v. Wang*, 53 U.S.P.Q.2d 1580, 1588 (Fed. Cir. 2000), *cert. denied*, 530 U.S. 1238 (2000) (if a reference teaches away then that fact alone can defeat obviousness). Significant reengineering would be required to combine

these two cited devices if that is even possible; it would clearly not be desirable given the background of the Speller patent and statement of the Audi employee. This is even more significant given that the Speller patent is primarily intended for use to upset a rivet adjacent the anvil 50 and not actually to receive and drive the rivet itself into a workpiece (see column 4, lines 4-8 of the '115 patent).

Moreover, it is significant that the electric motor disclosed in Speller upsets a conventional two-sided rivet on the anvil or die side of the machine. (See column 4, lines 4-10 of '115 patent). The Speller device is intended for use with a drill, a hole probe, a shave tool, a seal tool and a riveter in order to predrill a hole in the work piece, insert the rivet and upset the rivet. (See column 6, lines 50-54 and Figure 9 of '115 patent). This is significantly different than the self piercing rivet operation employed in the Cotterill reference and as claimed at elements (e) and (f) in Claim 22, element (c) of Claim 34, as element (c) of Claim 43, and on the eighth line of Claim 56 (as shown in Appendix A) . There is no suggestion or motivation to combine these very different types of fasteners.

As further evidence of secondary considerations supporting nonobviousness, Ekdahl explains, throughout columns 1 and 2, that there is a long felt but unsolved need for real time rivet inspection, that is being solved by the present invention. Also, column 5, lines 12 and 13, of Ekdahl teaches drilling before the rivet is inserted, thereby teaching away from the presently claimed invention's use of self piercing rivets (for the applicable claims in the present application). The Clew patent, commonly assigned with Cotterill, also teaches away from this combination.

By way of further example, element (c) of Claim 34 includes setting the rivet “by the punch acting with a substantially relatively stationary die.” The movable anvil of Speller teaches away from this feature. It is also noteworthy that neither Speller nor Cotterill teach, suggest or motivate “a sensor operable to indicate power consumption of the electric motor” as is claimed in independent Claim 43 as part of element (d).

In the present situation, even if the cited references disclose the features incorrectly alleged by the Examiner, the suggestion or motivation to combine the disparate references to arrive at the elements as presently claimed, is severely lacking. The claimed invention has been improperly used as a template to combine these assorted and far flung elements, thereby requiring reversal of the instant rejection. The secondary considerations of commercial success, licensing, industry significance, long felt but unsolved need, and teaching away from by others, as demonstrated by the Declarations, EWI License, and noted references further require a finding of nonobviousness of the presently claimed invention. Furthermore, the Examiner’s statement as to obvious design choices and inherency are respectfully challenged as lacking support, especially when viewed in combination with the other claim elements. Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

2. Legal and Factual Errors by the Examiner for Dependent Claims

The Examiner has made further factual errors with regard to the dependent claims. There is no teaching, suggestion or motivation by the cited

references for the new and nonobvious combination of the present claim elements, especially when the additional elements of each of the dependent claims are considered. For example, the Examiner cannot even find any reference to support his vague and unsupported “design choice,” “conventional in the ad [sic]” and “old and well known” assertions. These baseless comments by the Examiner are not evidence and do not show obviousness. As an example, what prior art teaches the offset nature of Claim 60? Accordingly, it is respectfully requested that the Board reverse the instant rejection.

H. 35 U.S.C. §103 Rejection of Claims 31, 32, 35-42 and 45-47

The Examiner has rejected Claims 31, 32, 35-42 and 45-47 under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al., Cotterill et al. and Gast. This rejection is respectfully traversed. It is believed that the originally filed claims are patentably distinct over the cited references.

In contrast to the Examiner’s assertions, the presently claimed combination of elements in Claims 31, 32, 35, 42 and 45-47 is new and nonobvious. None of the references cited by the Examiner disclose the above mentioned features, nor is there a suggestion or motivation to combine the cited references, and therefore, the claims at issue are patentably distinct over the cited references. The secondary considerations of commercial success, licensing, industry significance, long felt but unsolved need, and teaching away from by others, as demonstrated by the Declarations, and especially the EWI License and noted references further require a finding of nonobviousness of the presently claimed invention. Furthermore, the Examiner’s

statement as to design choice is respectfully challenged as lacking support, especially when considered with the combination of other claim elements. Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

I. 35 U.S.C. §103 Rejection of Claim 48

Claim 48 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al. in view of IBEC and Gast. This rejection is respectfully traversed. The originally filed claim is believed to be patentably distinct over the cited references.

In contrast to the Examiner's assertions, the presently claimed combination of elements in Claims 48 is new and nonobvious. None of the references applied by the Examiner teach the offset motor and punch element claimed at (b). Furthermore, "virtually all inventions are combinations of old elements" such that "rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be an illogical and inappropriate process by which to determine patentability." *In re Rouffet*, 47 U.S.P.Q.2d at 1457. Furthermore, the references applied by the Examiner do not contain the requisite suggestion or motivation necessary to show obviousness of the claimed invention. *See, Smith Indus. Medical Sys. Inc.*, 51 U.S.P.Q.2d at 1420-21.

The Examiner has ignored or improperly discounted the secondary considerations as presented in the Declarations and EWI License. These Declarations and the EWI License must be given their proper objective and significant weight to

defeat obviousness. See, *Stratoflex, Inc.*, 218 U.S.P.Q. at 880 (“secondary considerations must always . . . be considered”); see also, *Truswal Sys. Corp.*, 2 U.S.P.Q.2d at 1039 (“secondary in time does not mean that it is secondary in importance”).

None of the references cited by the Examiner disclose the above mentioned features, nor is there a suggestion or motivation to combine the cited references, and therefore, the claims at issue are patentably distinct over the cited references. “Care must be taken to avoid hindsight reconstruction by using the patent-in-suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit.” *Grain Processing Corp.*, 5 U.S.P.Q.2d at 1792. The Examiner should not “pick and choose among the individual elements of assorted prior art references to recreate the claimed invention.” *Symbol Technologies Inc.*, 19 U.S.P.Q.2d at 1246. The Examiner must identify the explicit statements in the prior art that demonstrate the alleged motivation, suggestion or teaching, and broad “conclusory statements standing alone are not ‘evidence’.” *In re Kotzab*, 55 U.S.P.Q.2d at 1317. In this regard, the Examiner has respectfully failed.

In contrast to the Examiner’s incorrect assertions, there is no suggestion or motivation to combine the electrically driven machine of Speller with the hydraulically actuated machine of the IBEC reference and the pneumatically driven slide 54 of Gast. To the contrary, the third party, Audi employee declaration of Konig states that in paragraph 6 that the “technology here employed is not to our knowledge usable for other, e.g., hydraulic, systems.” (emphasis added). This is the statement from a third

party customer, Audi, who was comparing a hydraulically driven self piercing riveting machine to the Emhart Tucker riveting machine disclosed and claimed in the present application.

Moreover, Speller, at column 1, lines 20-27, and in column 2, lines 11-18, teaches away from and discourages the use of hydraulics for riveting machines. See *generally, Winner Int'l Royalty Corp.*, 53 U.S.P.Q.2d at 1588 (if a reference teaches away then that fact alone can defeat obviousness). Significant reengineering would be required to combine these two cited devices if that is even possible; it would clearly not be desirable given the background of the Speller patent and statement of the Audi employee. This is even more significant given that the Speller patent is primarily intended for use to upset a rivet adjacent the anvil 50 and not actually to receive and drive the rivet itself into a workpiece (see column 4, lines 4-8 of the '115 patent). Clew also teaches away from making this combination.

In the present situation, even if the cited references disclose the features incorrectly alleged by the Examiner, the suggestion or motivation to combine the disparate references to arrive at the elements as presently claimed, is severely lacking. The claimed invention has been improperly used as a template to combine these assorted and far flung elements, thereby requiring reversal of the instant rejection. Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

J. 35 U.S.C. §103 Rejection of Claims 49 and 55

Claims 49 and 55 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al., IBEC, Gast and Cotterill et al. This

rejection is respectfully traversed. It is believed that the originally filed claims are patentably distinct over the cited references.

Further in contrast to the Examiner's assertions, the presently claimed combination of elements in Claims 49 and 55 is new and nonobvious. None of the references cited by the Examiner disclose the above mentioned features, nor is there a suggestion or motivation to combine the cited references, and therefore, the claims at issue are patentably distinct over the cited references. The claimed invention has been improperly used as a template to combine these assorted and far flung elements, and the secondary considerations have been ignored, thereby requiring reversal of the instant rejection. For example, the Examiner has also made unsupported assumptions regarding the flushness of the rivet head and the controller determination thereof (see Claim 55). Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

K. 35 U.S.C. §103(a) Rejection of Claim 58

The Examiner has rejected Claim 58 under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al., Cotterill et al. and the Affidavit of John Vrana. This rejection is respectfully traversed. It is believed that the originally filed claim is patentably distinct over the cited references.

First, the Affidavit of Vrana is defective since it does not say that it is based on personal knowledge. See, 37 C.F.R. §1.68 and M.P.E.P. §715.04. Furthermore, all of the statements in section numbers 3-6 cannot be considered as "prior art" under 35 U.S.C. since there is no time reference disclosed in the Affidavit and since the Affidavit was allegedly signed in 2001, well after the priority filing date for the

present application. Regardless, this Affidavit does not overcome the significant inability to combine the hydraulic drive of Cotterill with the electric drive of Speller especially in view of the teaching away from such and secondary considerations previously discussed herein. Again, the Examiner appears to be improperly using hindsight reasoning in combining these disparate references given the benefit of the present invention as a template. Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

L. 35 U.S.C. §103(a) Rejection of Claim 62

Claim 62 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al., Cotterill et al., IBEC and Gast. This rejection is respectfully traversed. It is believed that the originally filed claim is patentably distinct over the cited references. In contrast to the Examiner's incorrect hindsight assertions, there is no suggestion or motivation to combine the electrically driven machine of Speller with the hydraulically actuated machines of Cotterill and IBEC, and the pneumatically driven slide of Gast. Speller, Clew and the Audi declaration of Konig teach away from such a combination. For example, Speller teaches away from the claimed "die always aligned with the plunger." *See generally, Winner Int'l. Royalty Corp.*, 53 U.S.P.Q.2d at 1588. Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

M. 35 U.S.C. §103(a) Rejection of Claims 63 and 71

Claims 63 and 71 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al. in view of Cotterill and the Affidavit of Vrana. This rejection is respectfully traversed. The originally filed claims are patentably distinct over the cited references.

The Vrana Affidavit is defective as previously discussed. Furthermore, none of the references applied by the Examiner teach the offset motor and member element claimed in independent Claim 63. Moreover, none of the references applied by the Examiner teach the monitoring unit operably determining whether a portion of the rivet is flush with a workpiece surface as recited at (e) of independent Claim 71.

The presently claimed combination of elements in all of the claims is new and nonobvious. "Virtually all inventions are combinations of old elements" such that "rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be an illogical and inappropriate process by which to determine patentability." *In re Rouffet*, 47 U.S.P.Q.2d at 1457. Furthermore, the references applied by the Examiner do not contain the requisite suggestion or motivation necessary to show obviousness of the claimed invention. *See, Smith Indus. Medical Sys. Inc.*, 51 U.S.P.Q.2d at 1420-21.

None of the references cited by the Examiner disclose all of the above mentioned features, nor is there a suggestion or motivation to combine the cited references, and therefore, the claims at issue are patentably distinct over the cited

references. "Care must be taken to avoid hindsight reconstruction by using the patent-in-suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit." *Grain Processing Corp.*, 5 U.S.P.Q.2d at 1792. The Examiner should not "pick and choose among the individual elements of assorted prior art references to recreate the claimed invention." *Symbol Technologies Inc.*, 19 U.S.P.Q.2d at 1246. The Examiner must identify the explicit statements in the prior art that demonstrate the alleged motivation, suggestion or teaching, and broad "conclusory statements standing alone are not 'evidence'." *In re Kotzab*, 55 U.S.P.Q.2d at 1317. In this regard, the Examiner has respectfully failed. There is also a lack of motivation for the combination of the cited references suggested by the Examiner. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992).

In contrast to the Examiner's incorrect hindsight assertions, there is no suggestion or motivation to combine the electrically driven machine of Speller with the hydraulically actuated machine of Cotterill. To the contrary, the third party, Audi employee declaration of Konig states, in paragraph 6, that the electric motor driven, rotary-to-linear transmission, with sensor control "technology here employed is not to our knowledge usable for other, e.g., hydraulic, systems." (emphasis added). This is the statement from a third party customer, Audi, who was comparing a hydraulically driven self piercing riveting machine to the Emhart Tucker riveting machine disclosed and claimed in the present application.

Moreover, Speller, at column 1, lines 20-27, and in column 2, lines 11-18, teaches away from and discourages the use of hydraulics for riveting machines. See generally, *Winner Int'l Royalty Corp.*, 53 U.S.P.Q.2d at 1588 (if a reference teaches away then that fact alone can defeat obviousness). Significant reengineering would be required to combine these two cited devices if that is even possible; it would clearly not be desirable given the background of the Speller patent and statement of the Audi employee. This is even more significant given that the Speller patent is primarily intended for use to upset a two sided rivet adjacent the anvil 50 and not actually to receive and drive the rivet itself into a workpiece (see column 4, lines 4-8 of the '115 patent).

As further evidence of secondary considerations supporting nonobviousness, Ekdahl explains, throughout columns 1 and 2, that there is a long felt but unsolved need for real time rivet inspection, that is being solved by the present invention.

In the present situation, even if the cited references disclose the features incorrectly alleged by the Examiner, the suggestion or motivation to combine the disparate references to arrive at the elements as presently claimed, is severely lacking. The claimed invention has been improperly used as a template to combine these assorted and far flung elements, thereby requiring the Examiner to withdraw and overturn the instant rejection. Speller, Clew and the Audi declaration of Konig teach away from such a combination. Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

N. 35 U.S.C. §103(a) Rejection of Claims 64-77

Finally, the Examiner has rejected Claims 64-77 under 35 U.S.C. §103(a) as allegedly being unpatentable over Speller, Jr. et al., Cotterill et al., the Affidavit of Vrana and IBEC. This rejection is respectfully traversed. It is believed that the originally filed claims are patentably distinct over the cited references.

1. Legal and Factual Errors by Examiner

First, the cited references do not teach paragraph (c) of independent Claim 71. Second, the Vrana Affidavit is defective as previously discussed.

Third, the presently claimed combination of elements in all of the claims is new and nonobvious. The references applied by the Examiner do not contain the requisite suggestion or motivation necessary to show obviousness of the claimed invention. *See, Smith Indus. Medical Sys. Inc.*, 51 U.S.P.Q.2d at 1420-21. The Examiner has also improperly used hindsight reasoning. *See, Grain Processing Corp.*, 5 U.S.P.Q.2d at 1782.

In contrast to the Examiner's incorrect hindsight assertions, there is no suggestion or motivation to combine the electrically driven machine of Speller with the hydraulically actuated machines of Cotterill and IBEC. To the contrary, the third party, Audi employee declaration of Konig states, in paragraph 6, that the electric motor driven, rotary-to-linear transmission, with sensor control "technology here employed is not to our knowledge usable for other, e.g., hydraulic, systems." (emphasis added). This is the statement from a third party customer, Audi, who was comparing a

hydraulically driven self piercing riveting machine to the Emhart Tucker riveting machine disclosed and claimed in the present application.

Moreover, Speller, at column 1, lines 20-27, and in column 2, lines 11-18, teaches away from and discourages the use of hydraulics for riveting machines. See generally, *Winner Int'l Royalty Corp.*, 53 U.S.P.Q.2d at 1588 (if a reference teaches away then that fact alone can defeat obviousness). Significant reengineering would be required to combine these two cited devices if that is even possible; it would clearly not be desirable given the background of the Speller patent and statement of the Audi employee. This is even more significant given that the Speller patent is primarily intended for use to upset a two sided rivet adjacent the anvil 50 and not actually to receive and drive the rivet itself into a workpiece (see column 4, lines 4-8 of the '115 patent).

As further evidence of secondary considerations supporting nonobviousness, Ekdahl explains, throughout columns 1 and 2, that there is a long felt but unsolved need for real time rivet inspection, that is being solved by the present invention.

2. Legal and Factual Errors by Examiner for Dependent Claims

The Examiner has made further factual errors with regard to the dependent claims. There is no teaching, suggestion or motivation by the cited references for the new and nonobvious combination of the present claim elements, especially when the additional elements of each of the dependent claims are considered. For example, the cited references do not teach at least the features of a

determination of power consumption (Claims 68 and 73), torque (Claims 69 and 75) or flushness (Claim 70); or imperforated automotive vehicle panels (Claim 76), or the stroke motion and aligned die/punch (Claim 77), especially when combined with the other claim elements.

In the present situation, even if the cited references disclose the features incorrectly alleged by the Examiner, the suggestion or motivation to combine the disparate references to arrive at the elements as presently claimed, is severely lacking. The claimed invention has been improperly used as a template to combine these assorted and far flung elements in hindsight, thereby requiring the Board to withdraw and overturn the instant rejection. Speller, Clew and the Audi declaration of Konig teach away from such a combination. Accordingly, it is respectfully requested that the instant rejection be reversed and withdrawn.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

IX. EVIDENCE

The three Declarations and a license entered by or relied upon by the Examiner are attached hereto as Appendix B.

X. RELATED PROCEEDINGS

No related U.S. proceedings are referenced in Section II above and an EPO Opposition Decision is attached in Appendix C.

XI. CONCLUSION

For the foregoing reasons, the Examiner's rejections should be reversed and the rejected Claims 12, 15, 16 and 18-77 (in addition to those already allowed by the Examiner) allowed at the earliest possible date.

Respectfully submitted,

Dated: 5 FEB 2007

By: 

Monte L. Falcoff, Reg. No. 37,617

Michael E. Hilton, Reg. No. 33,509

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MLF/cmg

CLAIMS APPENDIX A

Claims Involved in the Appeal of Application Serial No. 09/862,688

12. A riveting electrical control system comprising:
- (a) an electrical control unit;
 - (b) an electric motor connected to the electrical control unit;
 - (c) a fluid-free transmission operably driven by energization of the electric motor;
 - (d) a riveting punch operably advanced by the transmission; and
 - (e) a sensor connected to the electrical control unit, the sensor being operable to sense riveting force.
15. The system of Claim 12 wherein the transmission operably converts rotary motion of the electric motor to linear motion for moving the punch.
16. The system of Claim 15 wherein the transmission includes a closed loop belt.
18. The system of Claim 12 further comprising a second sensor operably sensing an electrical power characteristic of the electric motor.

19. The system of Claim 12 further comprising a second sensor operably sensing a speed of the electric motor.

20. The system of Claim 12 further comprising a second sensor operably sensing a torque of the electric motor.

21. The system of Claim 12 wherein the electric control unit is a programmable computer.

22. A riveting electrical control system comprising:

- (a) an electrical control unit;
- (b) an electric motor connected to the electrical control unit;
- (c) a transmission operably driven by energization of the electric motor, the transmission operably converting rotational movement of the electric motor to substantially linear movement;
- (d) a riveting punch operably advanced in a substantially linear direction by the transmission;
- (e) a self-piercing rivet operably driven by the punch as controlled by the electrical control unit; and
- (f) a die operably diverging an end of the rivet without the rivet piercing completely through the exterior surface of a die-side workpiece adjacent the die;

the electric control unit operably controlling energization of the electric motor and operably determining if an undesired riveting condition is present.

23. The system of Claim 22 further comprising a sensor connected to the electrical control unit, the sensor being operable to sense a characteristic of the electric motor, wherein the characteristic changes at least in part due to varying rivet setting performance.

24. The system of Claim 23 wherein the characteristic is an electrical power characteristic of the electric motor.

25. The system of Claim 24 wherein the electrical power characteristic is electrical current.

26. The system of Claim 23 wherein the electrical control unit compares a signal from the sensor to previously stored data.

27. The system of Claim 22 wherein a rotational axis of the electric motor is offset from a centerline coaxial with an advancing direction of the punch.

28. The system of Claim 27 wherein the motor axis is substantially parallel to the punch centerline.

29. The system of Claim 22 wherein the electrical control unit includes a programmable microprocessor which automatically varies a riveting process based at least in part on the determination.

30. The system of Claim 22 wherein the electronic control unit automatically operably causes varying sized self piercing rivets to be operably driven by the punch.

31. The system of Claim 22 wherein the transmission is always coupled to the electric motor, and the electrical control unit transmits an error signal if the undesired condition is present.

32. The system of Claim 22 wherein the electrical control unit stops the rivet process if the undesired condition is present.

33. The system of Claim 22 wherein the electrical control unit determines if a riveting characteristic is within a desired range.

34. A control system comprising:

(a) a programmable control unit;

(b) a riveting machine including an electric motor and a transmission operable to convert rotary motion of the electric motor to linear motion of a punch;

(c) a self piercing rivet operably set by the punch acting with a substantially relatively stationary die of the riveting machine when the control unit causes energization of the electric motor; and

(d) a feeder operable to transfer the rivet to the riveting machine.

35. The system of Claim 34 further comprising a sensor located adjacent the rivet machine, the control unit being operable to receive a signal generated by the sensor.

36. The system of Claim 35 wherein the control unit compares the signal generated by the sensor to previously stored data.

37. The system of Claim 35 wherein the sensor is attached to the rivet machine, the transmission comprises a spindle and a nut enmeshed with the spindle, and the transmission is always coupled to the electric motor.

38. The system of Claim 35 wherein the sensor is operable to indicate a characteristic of the electric motor and the control unit varies the operation of the riveting machine during riveting based at least in part on output from the sensor.

39. The system of Claim 34 wherein the control unit is operable to control actuation of the rivet feeder.

40. The system of Claim 34 further comprising an articulating robot, the riveting machine being attached to and positioned by the robot.

41. The system of Claim 34 wherein the control unit transmits an error signal if an undesired condition is present.

42. The system of Claim 34 wherein the electrical control unit determines if a riveting characteristic is within a desired range, the rivet being of a hollow and diverging type with a solid head.

43. A control system comprising:

(a) a programmable controller;

(b) a riveting machine including an electric motor and a transmission always coupled to the electric motor during motor actuation, the transmission being operable to convert rotary motion of the electric motor to substantially linear motion;

(c) a rivet operably moved by the riveting machine when the controller causes energization of the electric motor, the rivet being of a hollow and diverging type with a solid head; and

(d) a sensor operable to indicate power consumption of the electric motor, the controller operably receiving a signal generated by the sensor.

44. The system of Claim 43 wherein the controller compares the signal generated by the sensor to previously stored values.

45. The system of Claim 43 further comprising a rivet feeder connected to the riveting machine, the controller operably controlling actuation of the rivet feeder.

46. The system of Claim 43 further comprising an articulating robot, the riveting machine being attached to and positioned by the robot.

47. The system of Claim 43 wherein the transmission includes an endless belt.

48. A control system comprising:

- (a) a programmable controller;
- (b) a riveting machine including an electric motor and a transmission, the transmission being operable to convert rotary motion of the electric motor to linear motion, a section of the electric motor being rotatable about an axis offset from a centerline coaxial with an elongated dimension of the punch;
- (c) a rivet operably moved by the riveting machine when the controller causes energization of the electric motor;
- (d) a sensor operable to indicate a riveting force characteristic, the controller operably receiving a signal generated by the sensor;
- (e) an articulating robot, the riveting machine being attached to and positioned by the robot; and
- (f) a rivet feeder connected to the riveting machine, the controller operably controlling actuation of the rivet feeder.

49. The system of Claim 48 wherein the controller compares the signal generated by the sensor to previously stored data, and the rivet having a solid head and a diverging open end which does not completely penetrate a workpiece farthest from the head.

50. A riveting electrical control system comprising:

- (a) an electrical control unit;
- (b) an electric motor connected to the electrical control unit;
- (c) a fluid-free mechanical transmission operably converting rotational movement of the electric motor to substantially linear movement, the transmission being coupled to the electric motor during motor use;
- (d) a rivet setting punch operably advanced by the transmission;
- (e) a substantially stationary die always aligned with the punch;

and

- (f) the electrical control unit operably determining if a riveted joint is within a desired range.

51. The system of Claim 50 wherein the electrical control unit stops the rivet process if the undesired condition is present.

52. The system of Claim 50 wherein the electrical control unit transmits an error signal if the undesired condition is present.

53. The system of Claim 50 wherein the electrical control unit includes a programmable microprocessor which compares sensed data to other data, and the electrical control unit continuously compares actual workpiece thickness signals to previously stored workpiece thickness signals substantially during rivet setting.

54. The system of Claim 50 wherein the electrical control unit operably determining if a riveted joint is within a desired range includes determining if a portion of a rivet is essentially flush with a punch-side workpiece outer surface without completely piercing through a die-side workpiece.

55. The system of Claim 48 wherein the controller determines if a head of the rivet is essentially flush with a punch-side workpiece outer surface without completely piercing through a die-side workpiece.

56. A riveting system comprising:

- an electric motor;
- a rotatable member operably driven by energization of the motor;
- a transmission serving to convert rotary motion of the rotatable member to linear motion;
- a plunger coupled to the transmission and being movable in a linear direction;
- a self piercing rivet operably driven by the plunger, the rivet being at least partially hollow; and
- a data monitoring unit electrically connected to at least one of: (a) the motor, and (b) the transmission.

57. The system of Claim 56 further comprising:
a housing surrounding a portion of the plunger;
a die;
a substantially C-shaped frame attaching the die to the housing;
and
a workpiece clamp coupled to the transmission and being linearly
movable.

58. The system of Claim 57 wherein the plunger and clamp are
movable together at a first speed during advancing movement, and the plunger is
subsequently movable at a second speed slower than the first speed when the
clamp is substantially stationary during rivet-to-workpiece engagement.

59. The system of Claim 56 wherein the transmission includes a
circulating ball spindle drive, further comprising a workpiece clamp operably
driven by the spindle drive.

60. The system of Claim 56 wherein the motor has a rotational
axis offset from an elongated centerline of the plunger.

61. The system of Claim 56 further comprising a punch-side
workpiece and a die-side workpiece, the rivet completely piercing the punch-side
workpiece but being prevented from completely piercing the die-side workpiece.

62. The system of Claim 56 further comprising:

a sensor connected to the monitoring unit;

the sensor being operable to detect at least one of: (a) clamp travel, (b) plunger advancing force, (c) clamp advancing force, (d) actuator power consumption, (e) actuator torque, and (f) transmission torque;

the sensor operably sending the detected information to the monitoring unit in order to determine the actual riveted joint condition;

a die always aligned with the plunger;

a frame securing the die; and

a robotic arm coupled to the frame.

63. A riveting system comprising:

- an electric motor;
- a transmission serving to convert rotary motion of the motor to linear motion;
- a member coupled to the transmission and being movable in a linear direction;
- a self piercing rivet operably driven by the member;
- a linearly movable workpiece clamp coupled to the transmission;
- the motor having a rotational axis offset from an elongated centerline of the member and the rotational axis of the motor being substantially parallel to the centerline of the member; and
- a member-side workpiece and a die-side workpiece, the rivet completely piercing the member-side workpiece but being prevented from completely piercing the die-side workpiece;
- the member and clamp being initially movable together at a first speed during advancing movement, and the plunger being subsequently movable at a second speed slower than the first speed when the clamp is substantially stationary during rivet-to-workpiece engagement.

64. The system of Claim 63 further comprising:
a data monitoring unit electrically connected to the motor;
a first sensor connected to the monitoring unit;
the first sensor being operable to detect at least one of: (a) clamp travel, (b) member advancing force, (c) clamp advancing force, (d) motor power consumption, (e) motor torque, and (f) transmission torque;
the first sensor operably sending the detected information to the monitoring unit in order to determine the actual riveted joint condition; and
a second sensor operably detecting a riveting characteristic and sending a corresponding signal to the monitoring unit in a real time, substantially closed loop manner.

65. The system of Claim 63 further comprising a force transducer operable to sense force applied by at least one of : (a) the member, and (b) the clamp.

66. The system of Claim 63 further comprising a displacement transducer operable to sense displacement of the member.

67. The system of Claim 63 further comprising a monitoring unit operably determining the quality of the riveting procedure based on at least the force applied by the member during the riveting procedure.

68. The system of Claim 67 wherein the monitoring unit determines the force of the member based at least on the power consumption of the motor.

69. The system of Claim 63 further comprising a monitoring unit determining the member force based at least on the torque of at least one of: (a) the motor, and (b) the transmission.

70. The system of Claim 63 further comprising a monitoring unit operably determining whether a portion of the rivet is flush with a surface of the member-side workpiece.

71. A riveting control system comprising:

- (a) an electric motor;
- (b) a transmission operably converting rotary motion of the motor to linear motion;
- (c) a plunger coupled to the transmission and being movable in a linear direction;
- (d) a rivet operably advanced by the plunger; and
- (e) a data monitoring unit operably comparing a characteristic indicative of an actual riveted joint condition to a previously stored value, the monitoring unit operably determining whether a portion of the rivet is flush with a workpiece surface.

72. The system of Claim 71 further comprising:

a first sensor connected to the monitoring unit operable to detect at least one of: (a) plunger advancing force, (b) clamp advancing force, (c) actuator power consumption, (d) actuator torque, and (e) transmission torque; and

a second sensor connected to the monitoring unit operable to detect a riveting characteristic;

the sensors operably sending the detected information to the monitoring unit.

73. The system of Claim 71 further comprising a sensor, the monitoring unit operably determining the riveting force of the plunger based at least on the power consumption of the motor as sensed by the sensor, and subsequent riveting force being varied based on the sensed power consumption.

74. The system of Claim 71 further comprising a displacement transducer operable to sense displacement of the plunger.

75. The system of Claim 71 wherein the monitoring unit determines the plunger force based at least on the torque of at least one of: (a) the motor, and (b) the transmission.

76. The system of Claim 71 wherein the rivet is a self-piercing rivet which is at least partially hollow, operably driven by the plunger into an imperforated portion of automotive vehicle panels.

77. The system of Claim 71 wherein the rivet is inserted and fully secured by a single and substantially continuous stroke of the plunger, further comprising a substantially stationary die always aligned with the plunger.

Application No.: 09/862,688

Docket No.: 0275M-000260/DVB

EVIDENCE APPENDIX B

Evidence Pursuant to §§1.130, 1.131, or 1.132 or Entered by or Relied Upon by the Examiner being Submitted in the Appeal of Application Serial No. 09/862,688:

1. Declaration of Dieter Mauer;
2. Declaration of Ralf England;
3. Audi Declaration; and
4. SPR Setting Machine Usage Agreement

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit:	3726)	
)	
Examiner:)	
)	
Inventor:	D. Mauer et al.)	DECLARATION OF DIETER MAUER
)	
Serial No:	09/119,255)	
)	
Filed:	July 20, 1998)	
)	
For:	PROCESS FOR FORMING A PUNCH RIVET CONNECTION AND A JOINING DEVICE FOR PUNCH RIVETS)	
)	

I, Dieter Mauer, hereby declare the following to be true and accurate, to the best of my personal knowledge:

1. I am a Manager of New Products for Emhart Tucker in Germany. I have been employed by Emhart Tucker or their predecessor companies for over thirty-five years.

2. Emhart Tucker has sold more than one hundred (100) rivet machines to AUDI for use on the A2 model vehicle. The A2 vehicle uses approximately 1,800 self piercing and hollow rivets to join the aluminum space frame body panels.

3. Each of the Emhart Tucker rivet machines sold to Audi employs:

an electric motor actuator;

a rotatable member operably driven by energization of the actuator;

a transmission serving to convert rotary motion of the rotatable member to linear motion;

a plunger coupled to the transmission and being movable in a linear direction; and

a rivet operably driven by the plunger.

4. It is my understanding from conversations I had with Audi, that Audi purchased these Emhart Tucker rivet machines primarily based on their technical merit rather than sales, marketing, advertising or price considerations. For example, it is my understanding that Audi found the durability and reliability of the electric motor driven, rotary-to-linear riveting machine of Emhart to be technically superior and more desirable than competitive hydraulically driven rivet machines. It is further my understanding that Audi found the process data monitoring, sensing and control ability for the Emhart Tucker rivet machines to be technically desirable and superior to competitive rivet machines.

5. The 17 November 1999 "Der Gott der Türen," echo newspaper articles show the Emhart Tucker rivet machine in the circled photographs. The Marz 1999 "Der Gott der Türen," Audi-Mobil newspaper article also shows the Emhart Tucker rivet machine in the central photograph.

6. Jaguar has recently compared competitive hydraulic riveting machines with Emhart Tucker rivet machines (such as that described in the above Paragraph No. 3). It is my understanding that Jaguar had recently purchased the competitive hydraulic machines and then rejected them as lacking the necessary durability and reliability. Jaguar had

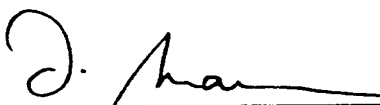
subsequently requested Emhart Tucker to quote an electric motor driven, rotary-to-linear rivet machines to be used in place of the hydraulic machines, primarily based on technical merit, not due to sales, marketing, advertising or price considerations. No decision has yet been received from Jaguar.

7. It is my understanding that many other major automakers in the United States and Europe have shown a great deal of interest in the Emhart Tucker rivet machine based on the machine's technical superiority over hydraulic rivet machines. The Emhart Tucker rivet machines are currently being tested by these United States and European automakers.

8. It is my opinion that Emhart Tucker has received significant commercial success for its electric motor driven, rotary-to-linear rivet machines, especially considering its fairly recent introduction to customers.

9. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief or upon my understanding are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: Nov. 7., 2000



Dieter Mauer

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit:	3726)	
)	
Examiner:	E. Omgba)	
)	
Inventor:	D. Mauer et al.)	DECLARATION OF
)	RALF ENGLAND
Serial No:	09/862,688)	
)	
Filed:	May 22, 2001)	
)	
For:	RIVETING SYSTEM AND)	
	PROCESS FOR FORMING A)	
	RIVETED JOINT)	
)	

I, Ralf England, hereby declare the following to be true and accurate, to the best of my personal knowledge:

1. I am a Product Manager for the self piercing rivet ("SPR") product line for Emhart Tucker in Germany. I am employed by Emhart Tucker which is a related company to the owner of the above identified patent application. I can understand, read and write English.

2. Emhart Tucker has now sold approximately one hundred fifty (150) SPR machines to AUDI.

3. Emhart Tucker has now sold approximately ninety (90) SPR machines to BMW; the order for which was only recently completed within the past few months.

4. Each of the Emhart Tucker SPR machines sold to Audi and BMW has a selling price of at least fifty five thousand (55,000) Euros.

5. Each of the Emhart Tucker SPR machines sold to Audi and BMW employs the items listed in the attached claims which I understand are pending in the above identified U.S. patent application.


6. It is my understanding upon information and belief, from conversations I personally had with Audi and BMW employees, that Audi and BMW purchased these Emhart Tucker SPR machines primarily based on their technical merit, for example due to essentially the mechanical and control system features noted in the attached claims (which lead to quality, durability and other functional advantages), rather than due to sales, marketing, advertising or price considerations.

7. It is my opinion upon information and belief, that Emhart Tucker has received significant commercial success for its electric motor driven, rotary-to-linear rivet machines, especially considering its fairly recent introduction by Emhart Tucker to customers since approximately 1998 or 1999. It is also my opinion upon information and belief that Emhart Tucker is one of at least three significant suppliers of SPR style machines in Europe to the automotive industry.

8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief or upon my understanding are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under

Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 12.12.02



Ralf England

U.S. Patent Ser. No. 09/862,688
0275M-000260/dvb

INDEPENDENT CLAIMS FROM U.S. PATENT SER. NO. 09/862,688

1. An electronic control system for use in a riveting process,
the system comprising:
 - an electronic control unit;
 - an electric motor connected to the electronic control unit;
 - a first sensor connected to the electronic control unit and the electric motor, the first sensor being operable to indicate at least one of: (a) torque of the electric motor, (b) speed of the electric motor, and (c) an electrical power characteristic of the electric motor; and
 - a second sensor connected to the electronic control unit, the second sensor operably detecting a riveting characteristic occurring during the riveting process, the riveting characteristic consisting essentially of at least one of: (a) riveting force, (b) rivet punch assembly location, (c) rivet size, and (d) workpiece thickness.
12. A riveting electrical control system comprising:
 - (a) an electrical control unit;
 - (b) an electric motor connected to the electrical control unit;
 - (c) a transmission operably driven by energization of the electric motor;
 - (d) a riveting punch operably advanced by the transmission;and

(e) a sensor connected to the electrical control unit, the sensor being operable to sense riveting force.

22. A riveting electrical control system comprising:

- (a) an electrical control unit;
- (b) an electric motor connected to the electrical control unit;
- (c) a transmission operably driven by energization of the electric motor, the transmission operably converting rotational movement of the electric motor to substantially linear movement;
- (d) a riveting punch operably advanced in a substantially linear direction by the transmission;
- (e) a self-piercing rivet operably driven by the punch as controlled by the electrical control unit; and
- (f) a die operably diverging an end of the rivet without the rivet piercing completely through the exterior surface of a die-side workpiece adjacent the die;

the electric control unit operably controlling energization of the electric motor and operably determining if an undesired riveting condition is present.

34. A control system comprising:
- (a) a programmable control unit;
 - (b) a riveting machine including an electric motor and a transmission operable to convert rotary motion of the electric motor to linear motion of a punch;
 - (c) a self piercing rivet operably set by the punch acting with a substantially relatively stationary die of the riveting machine when the control unit causes energization of the electric motor; and
 - (d) a feeder operable to transfer the rivet to the riveting machine.

48. A control system comprising:
- (a) a programmable controller;
 - (b) a riveting machine including an electric motor and a transmission, the transmission being operable to convert rotary motion of the electric motor to linear motion [sic, "motion"], a section of the electric motor being rotatable about an axis offset from a centerline coaxial with an elongated dimension of the punch;
 - (c) a rivet operably moved by the riveting machine when the controller causes energization of the electric motor;

(d) a sensor operable to indicate a riveting force characteristic, the controller operably receiving a signal generated by the sensor;

(e) an articulating robot, the riveting machine being attached to and positioned by the robot; and

(f) a rivet feeder connected to the riveting machine, the controller operably controlling actuation of the rivet feeder.

50. A riveting electrical control system comprising:

(a) an electrical control unit;

(b) an electric motor connected to the electrical control unit;

(c) a mechanical transmission operably converting rotational movement of the electric motor to substantially linear movement; and

(d) a rivet setting punch operably advanced by the transmission;

(e) the electrical control unit operably determining if a riveted joint [sic, add "characteristic"] is within a desired range.

0275M-000260/dvb

[Translation from German]

AUDI declaration regarding the Emhart Tucker company's self-piercing rivet system patent application

I hereby make the following statement:

1. I am now and have for many years been an employee of Audi AG.
2. The firm of Emhart Tucker has to my knowledge put more than 100 self-piercing rivet system into service in Vehicle Project A2 at the Neckarsulm Audi plant.
3. The Tucker self-piercing rivet systems are based on an electric motor drive triggering a linear ram motion by way of a rotary motion, guiding a self-piercing rivet in the direction of the sheets to be connected.
4. On the basis of the decision to implement this technology, I was involved in the procurement of these self-piercing rivet systems (involved personally in the form of executing signatures for contracts/orders)
5. Audi procured these electric motor systems on the basis of a system comparison with a bidder on hydraulic self-piercing rivet systems, the decision as to which systems to procure being dependent on the circumstances of use in each case.
6. The decision to procure electric-motor Tucker self-piercing rivet systems was documented/supported in a purely technical manner, and not influenced by advertising, special marketing or price considerations (price equality of types). (See also attached 'Electric Motor/Hydraulic System Comparison.')

7. In the field of electric motor self-piercing rivet systems, no other offerer was active, viz. to Audi's knowledge also there was and is no one else who has this technology. Still, the firm of Emhart Tucker has brought the imaging of the process data, the requisite sensory system and the control technology to a high level, in terms of the circumstances of employment. The technology here employed is not to our knowledge usable for other, e.g. hydraulic, systems.

8. Clinch and self-piercing rivets are different techniques/processes, and in their result for the connection of metal sheets they are not interchangeable without adjustment of the requisite boundary conditions.

9. I am of opinion that the development of the electric motor self-piercing rivet system technology as carried on by Tucker to Audi's requirements will also enjoy good economic success in the longer term, the collaboration between the two firms having brought this development to the point of mass production.

TRANSLATION ACES

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New York, NY 10006-3279

Tel. (212) 269-4660 ♦ Fax (212) 269-4662



AFFIDAVIT OF ACCURACY)
)
STATE OF NEW YORK) ss.:
)
COUNTY OF NEW YORK)

I, the undersigned, being duly sworn, depose and state:

I am qualified to translate from the German language into the English language by virtue of being thoroughly conversant with these languages and, furthermore, having translated professionally from German into English for more than 10 years;

I have carefully made the translation appearing on the attached and read it after it was completed; and said translation is an accurate, true and complete rendition into English from the original German -language text, and nothing has been added thereto or omitted therefrom, to the best of my knowledge and belief.

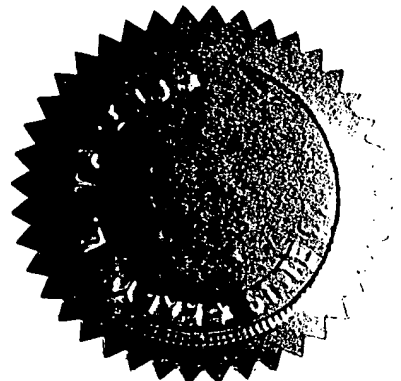
Ernst van Haagen

TRANSLATION ACES, INC.

Ernst van Haagen

Subscribed and sworn to before me
this 9th day of October, 2002.

Karyn L. Tasens
KARYN L. TASENS
Notary Public, State of New York
No. 31-4660695
Qualified in New York County
Commission Expires Oct. 31, 2002



AUDI-Erklärung zur Patentanmeldung Stanznietsystem Fa. Emhart Tucker

Hiermit erkläre ich wie folgt:

1. Ich bin zur Zeit und seit vielen Jahren Mitarbeiter der AUDI AG
2. Die Fa. Emhart Tucker hat nach meiner Kenntnis mehr als 100 Stanzniet~~Systeme~~ Systeme im Fahrzeug-Projekt A2 im Werk AUDI- Neckarsulm zum Einsatz gebracht.
3. Die Tucker-Stanznietssysteme basieren auf einem elektromotorischen Antrieb, der über eine Drehbewegung eine lineare Stempelbewegung auslöst, bei der ein Stanzniet in Richtung der zu verbindenden Bleche geführt wird.
4. Basierend auf der Entscheidung, diese Technik einzusetzen, war ich an der Beschaffung dieser Stanznietssysteme beteiligt (persönlich beteiligt in Form der Unterschriftsleistung für die jeweiligen Aufträge/Bestellungen).
5. AUDI beschaffte diese elektromotorischen Systeme auf der Basis eines SystemVergleichs mit einem Anbieter für hydraulische Stanznietssysteme, wobei die Festlegung, welche Systeme zu beschaffen sind, vom jeweiligen Einsatzfall abhängig waren.
6. Die Entscheidung, elektromotorische Tuckerstanznietssysteme zu beschaffen, wurde rein technisch belegt/gestützt und nicht durch Werbung, besonderes Marketing

oder preisliche Vorteile beeinflusst (Preisgleichheit der Ausführungen). (Siehe hierzu auch die Anlage

'Systemvergleich elektromotorisches / hydraulisches System')

7. Im Bereich der elektromotorischen Stanznietssysteme war kein weiterer Anbieter tätig bzw. gab und gibt es auch nach Kenntnisstand AUDI keinen weiteren mit dieser Technik. Dennoch hat Fa. Emhärt Tucker die Abbildung der Prozess-Daten, die erforderliche Sensorik und die Steuerungstechnik auf ein hohes Niveau gebracht, bezogen auf die Einsatzfälle. Die hier eingesetzte Technik lässt sich nach unserem Kenntnisstand nicht für andere z. B. hydraulische Systeme einsetzen.

8. Clinchen und Stanznieten sind unterschiedliche Techniken/Prozesse und in ihrem Ergebnis bei der Verbindung von Blechen nicht ohne Änderung der erforderlichen Randbedingungen austauschbar.

9. Ich bin der Ansicht, dass die von Tucker nach den Anforderungen von AUDI getriebene Entwicklung der elektromotorischen Stanznietssystemtechnik auch in der weiteren Sicht zu einem guten wirtschaftlichen Erfolg führen wird wobei die Zusammenarbeit der beiden Firmen die Entwicklung zur Serienreife geführt hat.

AUDI-Erklärung zur Patentanmeldung Stanziensystem Fa. Emhart Tucker /Anlage 1

/PG -223

Empfehlungsliste für SNZ - Systeme

		elektr.	hydraulisch
Technische Empfehlung	Einsatzfall		
	Zange am Roboter	✓	✓
	Zangenwechsel am Roboter	✓	
	Stat. Zange vom Roboter bedient	✓	✓
	Zange - handgeführt, 3er Niet		✓
	Zange - handgeführt, 5er Niet		✓
	Stat. Zange - man. bedient, Taktzeit --> unkritisch	✓	✓
	Stat. Zange - man. bedient, Taktzeit --> kritisch		✓
Abweichungen durch Störkonturen	Mögliche Abweichungen		
	Höhe > 70mm		✓
	Niederhalterlänge 20mm fest		✓
	Variable Niederhalterlänge 10 oder 30mm	✓	
	Grundsätzlich sind die jeweiligen Außenstörkonturen zu berücksichtigen	✓	✓
Abweichungen durch Produktanforderungen	Niederhaltereinstellbarkeit (Druck)		✓
	Weicher Niederhalter (Aus Kunststoff, für Außenhaut)	✓	
	Qualitätsanforderungen / Kurvenüberwachung	✓	
	Hubgeschwindigkeit / Prozeßzeit		✓
	Nietgröße 5 x 5 / 5 x 6,5		✓
Sonst. Entscheidungsgründe	(Ölfester Bodenanstich nicht erforderlich etc.)	✓	
	geringer Lärmpegel	✓	
	Garantieleistung auf Kräfteerzeugniseinh. > 1Mio Zyklen	✓	
	Garantieleistung auf C-Bügel > 7,5 x 10 ⁸ Zyklen	✓	
	Vor Ort-Service SOP - 1Jahr nach SOP	✓	
	Eingriff in Steuerung möglich		✓
	Stillstand bei Nieten ohne Niet	✓	
	Stillstand bei Nieten ohne Blech	✓	

Tuckerboilage_Auswahl_Systemsatz2.xls

[Translation from German]

AUDI declaration regarding the Emhart Tucker company's self-piercing rivet system patent application / attachment 1

I/PG-223

Recommendation List for SNZ-Systems

		electric	hydraulic
Technical recommendation	Application		
	tool on robot	X	X
	tool replacement at robot	X	
	stationary tool operated by robot	X	X
	tool – hand-held, 3 series rivet		X
	tool – hand-held, 5 series rivet		X
	stationary tool – manually operated, cycle time --> not critical	X	X
Deviations due to interfering contours	stationary tool – manually operated, cycle time --> critical		X
	Possible Deviations		
	strokes > 70 mm		X
	rivet holder length 20 mm fixed		X
	variable rivet holder length 10 or 30 mm	X	
Deviations due to product requirements	the outer interfering contours must be allowed for in every case	X	X
	Pressure pad adjustability (pressure)		X
	Soft pressure pad (of plastic, for exterior paneling)	X	
	Quality requirements / curve monitoring	X	
	Stroke speed / process time		X
Other decision grounds	rivet size 5 x 5 / 5 x 6.5		X
	(oil-resistant bottom coat not required etc.)	X	
	low noise level	X	
	guarantee on power unit > 1 million cycles	X	
	guarantee on C-clamps > 7.5 x 10 ⁶ cycles	X	
	on-site service SOP – 1 year after SOP	X	
	intervention in control system is possible		X
	stop when riveting without rivet	X	
	stop when riveting without sheet metal	X	

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) ss.:
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I have carefully made the translation appearing on the attached and read it after it was completed; and said translation is an accurate, true and complete rendition into English from the original German-language text, and nothing has been added thereto or omitted therefrom, to the best of my knowledge and belief.

A handwritten signature in cursive script, reading 'Robin Esterberg', written over a horizontal line.

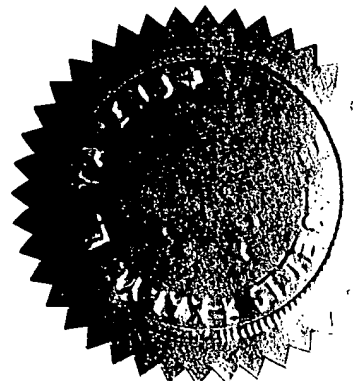
TRANSLATION ACES, INC.
BERTRAND LANGUAGES INC.
Robin Esterberg

Subscribed and sworn to before me

this 9th day of October, 2002.

A handwritten signature in cursive script, reading 'Karyn L. TSENS', written over a horizontal line.

KARYN L. TSENS
Notary Public, State of New York
No. 31-4680695
Qualified in New York County
Commission Expires Oct. 31, 2002



- Redacted -

SPR SETTING MACHINE USAGE AGREEMENT

This **SPR SETTING MACHINE USAGE AGREEMENT** ("Agreement") is made and entered into as of the last execution date below ("Effective Date"), by and between **EDISON WELDING INSTITUTE**, an Ohio company having an address at 1250 Arthur E. Adams Drive, Columbus, Ohio 43221 (hereinafter, "EWI"), and **EMHART TEKNOLOGIES, INC.** (hereinafter "EMHART"), which is a company organized under the state of Delaware, having a place of business at 49201 Gratiot Avenue, Chesterfield, MI 48051.

In consideration of the promises and the faithful performance of the mutual covenants contained herein, full and sufficient consideration having been provided and the receipt and adequacy of which is acknowledged by EMHART and EWI, the Parties agree as follows:

SECTION 1. DEFINITIONS

1.1 "Affiliate," "Affiliates" and an "Affiliated company" shall mean any subsidiary, joint venture, parent company or corporate entity related to a Party hereto provided that fifty percent (50%) or more of the outstanding shares of the stock in such subsidiary, joint venture, parent company or related corporate entity which is entitled to vote for the election of directors in the case of a stock issuing entity or fifty percent (50%) or more of which in the case of a non-stock issuing entity, is owned or controlled, directly or indirectly, by or of a Party hereto, but only as long as such ownership or control exists.

1.2 "Confidential Information" shall include: all inventions, proprietary information, technical know-how, trade secrets, pending patent applications, computer software, technical drawings, business plans, business information (including the existence, subject matter, and terms of this Agreement), and products, which may be communicated in writing, orally, or by other tangible medium. At least the installation manuals, operation manuals, computer software, and internal components (those hidden from view when fully assembled) of the SPR Machine shall be considered

Confidential Information of EMHART. The following shall not constitute Confidential Information: (a) information which at the time of disclosure to receiving Party by the disclosing Party, was generally and publicly known to a majority in the automotive fastener industry; (b) information which was possessed by receiving Party, as demonstrated by the receiving Party's written or other tangible evidence, before receipt thereof from the disclosing Party; (c) information which is disclosed to the receiving Party in good faith by a third party who has an independent right to such information; or (d) information ordered to be disclosed by a judicial court or governmental administrative agency, with prior notice of such a possible issue being promptly provided to the disclosing Party so it can seek a protective order. These exceptions must be substantiated by the receiving Party through corroborated, written or physical proof, and by clear and convincing evidence, if so requested by the disclosing Party.

1.3 "Licensed Patents" shall mean: (a) U.S. Patent No. 6,276,050 entitled "Riveting System and Process for Forming a Riveted Joint " which issued on August 21, 2001; (b) U.S. Patent No. 6,502,008 entitled "Riveting System and Process for Forming a Riveted Joint " which issued on December 31, 2002; (c) U.S. Patent Application Serial No. 09/862,688 entitled "Riveting System and Process for Forming a Riveted Joint" which was filed on May 22, 2001; and (d) U.S. Patent Application Serial No. 10/300,317 entitled "Riveting System and Process for Forming a Riveted Joint" which was filed on November 20, 2002, which are all assigned to Newfrey LLC, EMHART or one of their Affiliates.

1.4 "Parties" shall mean both EMHART and EWI, and "Party" shall mean EMHART or EWI.

1.5 "SPR Machine" shall mean the self piercing rivet machine, WD810 series or equivalent, made by or on behalf of EMHART.

SECTION 2. LOAN OF EQUIPMENT BY EMHART AND USE BY EWI

2.1 EMHART shall loan the SPR Machine to EWI for a term beginning within thirty (30) days of the Effective Date of this Agreement and naturally terminating two (2) year thereafter, unless the term is terminated earlier as provided for in this Agreement.

2.2 EWI shall only use the SPR Machine for experimental and testing purposes which are non-competitive with EMHART and noncommercial in nature, and only at the EWI address provided for in this Agreement.

2.3 EWI shall not duplicate the SPR Machine or any part thereof.

2.4 EWI shall only use the SPR machine in accordance with an installation or operating manual supplied by EMHART to EWI.

2.5 All title and ownership of the SPR Machine shall remain with EMHART or its Affiliates.

SECTION 3. LICENSE GRANT BY EMHART

3.1 EMHART hereby grants to EWI and EWI hereby accepts from EMHART, upon the terms and conditions specified herein, a license under the Licensed Patents to only use the SPR Machine for the term of this Agreement, but only for the use specified in Section 2.2 of this Agreement.

3.2 EWI agrees that the product covered by all of the claims of the Licensed Patents has exhibited commercial success, is valuable and is a significant improvement in the industry.

3.3 EMHART agrees that it will not use EWI's name to promote its business or products to others, whether through advertising or sales promotion or the solicitation of investors.

SECTION 4. IMPROVEMENTS

4.1 It is expressly understood and agreed that the disclosing party owns the confidential information and does not grant any right, license, privilege or immunity, express or implied, to the receiving party under any Confidential Information patent or proprietary right of the disclosing party.

The receiving party, its employees and its agents agree to maintain confidential any equipment, process or technique that they may be exposed to in the course of development, installation, application analysis, or service and repair, while within the disclosing party's facilities.

The Parties agree that any and all enhancements, improvements, modifications, inventions, ideas, or know-how developed, conceived, or discovered (hereinafter "Improvements")

The Parties will negotiate and mutually agree upon whether patents, patent applications, or any other intellectual property right should be obtained that covers or protects any jointly developed Improvement. If the parties disagree on the desirability of legally protecting the jointly developed Improvements, the party in favor of obtaining the protection may apply for such protection at their own expense, and the other party shall assist in obtaining that protection. In such a situation, the party paying for the protection shall own all rights in the jointly developed Improvements and the opposing party shall have a royalty free non-exclusive, non-assignable (except as part of a sale of the business as a whole) license to use the jointly developed Improvements for their

4.2 The ownership and Improvement licensing rights of this Section 4 shall survive termination of this Agreement.

SECTION 5. CONFIDENTIALITY AND PUBLICATION RIGHTS

5.1 EWI shall use its best efforts to keep the EMHART Confidential Information as confidential, and shall not disclose same outside of EWI and EMHART, except as specifically and explicitly allowed in this Agreement for test result publication purposes only. This confidentiality obligation shall survive termination of this Agreement.

SECTION 6. TERMINATION

6.1 Either Party may terminate this Agreement in writing at any time and for any reason.

6.2 Upon termination, EWI shall immediately cease all use of the SPR Machine and return the SPR Machine and all manuals and other materials provided by EMHART, to EMHART, within thirty (30) days, F.O.B. EMHART's facility in Chesterfield Township, Michigan.

SECTION 7. WARRANTIES AND REPRESENTATIONS

7.1 EMHART represents and warrants that it and/or its Affiliates exclusively owns the entire right, title, and interest in and to the Licensed Patents and SPR Machine, has authority to enter into this Agreement and is free to grant the license and perform its obligations as provided for in this Agreement.

7.2 EWI represents and warrants that it has authority to enter into this Agreement and perform its obligations as provided for in this Agreement, and that the performance by EWI of its duties and obligation hereunder does not violate any prior, existing, and will not violate any future contract, obligation, or understanding that EWI may have or subsequently enter into with another.

7.3 Nothing contained in this Agreement shall be construed as: (a) A warranty or representation by EMHART as to the validity, enforceability, scope or eventual issuance of any patents, including the Licensed Patents; (b) A warranty or representation by EMHART that any use by EWI will be free from infringement of third party patents or other intellectual property rights; (c) Conferring by implication, estoppel or otherwise, upon EWI, any license or other right under any EMHART patent, trademark, trade secret, or know-how except the license expressly granted herein; (d) An obligation by EMHART to bring or prosecute actions or lawsuits against third parties for infringement; or (e) An obligation by EMHART to pay any maintenance, annuity, or other fees due to maintain any patents referenced herein.

SECTION 8.

8.1

SECTION 9. MISCELLANEOUS

9.1 EWI may not transfer, reassign or sublicense any of its rights under this Agreement or to the SPR Machine.

9.2 This Agreement and matters connected with the performance thereof shall be construed, interpreted, applied, and governed in all respects in accordance with the laws of the State of Delaware (without regard to the choice of law provisions thereof).

9.4 This Agreement constitutes the entire agreement between EWI and EMHART with respect to the subject matter hereof and supersedes and replaces all previous negotiations, commitments, verbal discussions, and writings with respect thereto and may not be modified or amended except by a writing duly signed by the authorized representatives of each of the parties.

IN WITNESS WHEREOF, the parties have caused this Agreement to be duly executed by their representatives.

EMHART TEKNOLOGIES, INC.

Edison Welding Institute

By: Christine Yingli Lee

By: James Bauer

Typed Name: CHRISTINE YINGLI LEE

Typed Name: JAMES BAUER

Officer Title: Director of R&D

Officer Title: MGR. CONTRACTS

Date: January 9, 2004

Date: 1/15/04

(SPR Setting Machine Usage Agreement)

Application No.: 09/862,688

Docket No.: 0275M-000260/DVB

RELATED PROCEEDINGS APPENDIX C

Proceedings Related to the Appeal of Application Serial No. 09/862,688

NONE

However, a negative EPO Opposition Decision of 16 March 2006 for an equivalent case to the German priority application is enclosed. It is noteworthy that the opposition claims were very different than those presently on appeal herein.



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Beschwerdekammern

Boards of Appeal

Chambres de recours

Haar, Lucas Heinz Jörn
Patentanwälte Haar & Schwarz-Haar,
Lessingstrasse 3
61231 Bad Nauheim
ALLEMAGNE



Datum/Date

- 4. 05. 06

Zeichen/Ref./Réf.

OPEP3000GER5188

Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n°

98305474.3 - 2302 / 0893179

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire

Newfrey LLC

Appeal Number - Board

T 197/04-3201

Please find enclosed a copy of the decision dated 16.03.06 .

 A. Vottner

The registry:

Phone: (089) 2399 - 3211



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Europäisches
Patentamt

European
Patent Office

Office européen
des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Every, David Aidan
MARKS & CLERK,
Sussex House,
83-85 Mosley Street
Manchester M2 3LG
GRANDE BRETAGNE



Datum/Date

- 4. 05. 06

Zeichen/Ref./Réf. DE/J392088PMI	OPPO 01	Anmeldung Nr./Application No./Demande n° /Patent Nr./Patent No./Brevet n°. 98305474.3 - 2302 / 0893179
Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire Newfrey LLC		

Appeal Number - Board

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Please find enclosed a copy of the decision dated 16.03.06

A. Vottner

The registry:

Phone: (089) 2399 - 3211

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DECISION
of 16 March 2006

Case Number: T 0197/04 - 3.2.01

Application Number: 98305474.3

Publication Number: 0893179

IPC: B21J 15/02, B21J 15/26,
B21J 15/28

Language of the proceedings: EN

Title of invention:
Process for forming a punch rivet connection

Patentee:
Newfrey LLC

Opponent:
HENROB LIMITED

Headword:
-

Relevant legal provisions:
EPC Art. 56
RPBA Art. 10b(3)

Keyword:
"Inventive step - no"
"Request to amend - refused"

Decisions cited:
-

Catchword:
-



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Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number: T 0197/04 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 16 March 2006

Appellant:
(Opponent) HENROB LIMITED
Second Avenue
Zone 2, Deeside Industrial Park
Flintshire, CH5 2NX (GB)

Representative: Every, David Aidan
MARKS & CLERK
Sussex House
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Manchester, M2 3LG (GB)

Respondent:
(Proprietor of the patent) Newfrey LLC
1207 Drummond Plaza
Newark, DE 19711 (US)

Representative: Haar, Lucas Heinz Jörn
Patentanwälte Haar & Schwarz-Haar
Lessingstrasse 3
D-61231 Bad Nauheim (DE)

Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
26 November 2003 concerning maintenance of
European patent No. 0893179 in amended form.

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
C. Heath

Summary of Facts and Submissions

- I. The opponent's appeal is directed against the decision posted 26 November 2003 according to which it was found that, account being taken of the amendments made by the patent proprietor during the opposition proceedings, European patent No. 0 893 179 and the invention to which it relates meet the requirements of the EPC.
- II. The following prior art documents filed during the opposition procedure played a role during the appeal proceedings:
- D11: Lothar Budde et al., "Stanznieten ist zukunftsträchtig in der Blechverarbeitung", Bänder Bleche Rohre, 5-1991, 94-100
- D15: WO-A-95/08860.
- III. In a communication pursuant to Article 11(1) RPBA the board indicated its provisional opinion that the closest prior art was known from D11 and that one relevant point in respect of inventive step related to the suitability of the actuator according to D15 for use in a punch-riveting machine. It set a time limit of one month before the date for the oral proceedings for the filing of any further requests or written submissions and reminded the parties of the provisions of Article 10b RPBA.

- IV. On 22 February 2006 the appellant filed an additional document:

D30: Publicity brochure "Exlar Product specifications - GS Series Linear Actuators", together with a letter concerning its distribution.

- V. During oral proceedings held on 16 March 2006 the appellant requested that the contested decision be set aside and the patent revoked. The respondent requested that the appeal be dismissed. Shortly before the board retired to deliberate on inventive step the respondent asked for the opportunity to file an amended request.

- VI. Claim 1 as approved by the opposition division reads:

"Process for forming a punch rivet connection in which a plunger (4) and a holding-down device (5) are driven by a transmission unit (2) which converts a rotational movement of an electrically powered drive unit (1) into a translation movement of the plunger (4) and/or of the holding-down device (5), and the drive unit (1) is controlled by a control unit (9) receiving open and closed-loop control process data that are determined during the punch riveting process in the formation of the punch rivet connection."

- VII. The appellant's submissions may be summarised as follows:

The amendments made to claim 1 during the opposition procedure do not satisfy the provision of Article 123(2) EPC. The amended wording states that the control unit receives open and closed-loop control data but does not

specify the source of this data. In the application as originally filed it was disclosed only that this data be supplied by the monitoring unit.

The contested decision and statements made by the patent proprietor during the opposition procedure imply that the closed-loop aspect of the subject-matter according to present claim 1 control process parameters during insertion of the rivet. This should distinguish the claimed subject-matter from the prior art in which the parameters are set in advance of beginning the process. However, the specification indicates only that the control parameters are used to deliver a statement of the quality of the riveted joint. There is no teaching to the skilled person as to how he might achieve control of the process during the insertion of the rivet, in contravention of the requirement of Article 83 EPC.

The closest prior art is that known from D11. In comparison with that disclosure the subject-matter of present claim 1 contains the feature of an electric drive unit and a transmission unit which converts rotational movement into a translational movement of the plunger. The problem to be solved is to permit better control of the riveting process. D11 already stresses the importance of controlling the riveting process and the skilled person would be aware that electrical drives have the benefit of superior control in comparison with hydraulic drives. He would therefore consider an actuator such as is disclosed in D15. Moreover, these drives are well known alternatives and the patent discloses no special effects achievable by the substitution. A punch-riveting process does not

imply any particular requirements as regards force since this is dependent on the materials to be riveted, which may be merely leather or plastic. Moreover, present claim 1 includes the possibility of only operating the holding-down device to retain the material in position during punching, which implies the application of a relatively low load.

VIII. The respondent replied essentially as follows:

The skilled person reading the original application would readily appreciate that the essential aspect is that the control unit receives open and closed-loop control data, not whether this has been transmitted by the monitoring unit.

Closed-loop control is well known to the skilled person. It is disclosed in the specification which parameters are to be measured and the skilled person would understand how these may be used to control the process. The more detailed explanation in the specification regarding the possibility of post-process analysis does not detract from the teaching to the skilled person regarding control during the process.

It has not been clearly demonstrated that the brochure D30 forms prior art within the meaning of Article 54 EPC and it therefore should be disregarded.

D11 is a complete teaching. It indicates that closed-loop control can bring benefits and proposes implementing this in combination with a hydraulic actuator. The skilled person need look no further for the improved working solution. By contrast, the

actuator according to D15 would require development in order to make it suitable as regards operating force, stroke length and speed. It would suffer from problems of friction and wear and would not apparently be as reliable as a hydraulic actuator. In particular, it is not clear that it could cope with its movement being blocked, as occurs in a punch-rivet machine.

Present claim 1 in one alternative relates to the possibility of driving both the punch and the holding-down device using a single actuator. In response to the appellant's filing of D30 the respondent should be given the opportunity to amend the claim to define only the specified alternative, even if the board follows the respondent's request to disregard this document.

Reasons for the Decision

Procedural matters

1. The appellant justifies the late filing of D30 by stating that it was filed in response to the point raised by the board in its communication concerning the suitability of the actuator according to D15 for use in a punch-rivet machine disclosed in D11. D30 nevertheless was filed after the time limit set by the board for the filing of further written submissions. Under these circumstances and since the board finds it to be not essential to the decision D30 is disregarded in accordance with Article 114(2) EPC.

2. At the opening of the oral proceedings the respondent confirmed its single request which had been filed in writing, to dismiss the appeal. In the course of the oral proceedings the respondent opposed the introduction of D30 and on the board's direction both parties presented their case in respect of inventive step in the light of only such evidence as was already in the proceedings. At the closure of the debate on inventive step the respondent asked for the opportunity to file an amended request having a claim 1 directed to a process in which the alternatives designated in the claim by "and/or" be deleted in order to specify that both the plunger and the hold-down unit are driven in the specified way.

2.1 This was the first time that any emphasis had been placed on this aspect of the claim. Throughout the opposition and appeal proceedings the respondent had argued on the basis that the form of the actuator was the essential element of its invention and at no time had it even made reference to the combination of features which would form the basis of the new request. The thrust of the teaching in the patent specification is also directed towards the aspect of the form of the actuator. Indeed, in column 5, lines 23 to 26 it is stated that whether merely the plunger or also the holding-down device is connected to the transmission unit depends on whether the joining device is used to form a punch-rivet connection with a solid or a hollow rivet. Under these circumstances neither the appellant nor the board could have been expected to anticipate such a change of direction. To shift the emphasis of the claimed subject-matter during the oral proceedings in the proposed manner would require continuation in

written proceedings to enable the appellant to reconsider its case.

- 2.2 Article 10b(3) RPBA states that "amendments sought to be made after oral proceedings have been arranged shall not be admitted if they raise issues which the Board or the other party ... cannot reasonably be expected to deal with without adjournment of the oral proceedings". This is clearly the situation in the present case and the respondent's request therefore cannot be admitted. Further consideration of the case is therefore based on claim 1 as approved by the opposition division.

Amendment of the claim

3. In comparison with its form as granted claim 1 has been amended by adding the following feature:

- the drive unit is controlled by a control unit receiving open and closed-loop control process data that are determined during the punch-riveting process in the formation of the punch-rivet connection.

The appellant finds this amendment objectionable in accordance with Articles 83 and 123(2) EPC. The board does not agree. The skilled person is well acquainted with the concept of open and closed-loop control and how to process data accordingly. Moreover, it is clear to the skilled person faced with the application as originally filed that it is essential merely that the data is received by the control unit, not whether it is transmitted by a monitoring unit or an alternatively designated unit. However, as set out below, the board

finds that the subject-matter of claim 1 even after amendment does not involve an inventive step. Under these circumstances it is not necessary to provide detailed reasoning in respect of the present objections.

Inventive step

4. The closest prior art is the disclosure contained in D11. This is a review of the technology relating to punch-riveting, covering both the machinery and such aspects as quality control. In respect of the latter D11 discloses not only open-loop control in order to act as a quality check but also suggests development to include closed-loop control to ensure reliable riveted connections without the need for quality procedures such as destructive testing. The only drive unit disclosed is a hydraulic cylinder. The respondent has not challenged the view taken by both the board and the appellant that the subject-matter of present claim 1 differs from that of D11 only by the feature of a transmission unit which converts a rotational movement of an electrically powered drive unit into a translation movement. The skilled person faced with the disclosure of D11 and attempting to put into effect its teaching regarding the improvements achievable by improved control arrangements would become aware that the use of closed-loop control with a hydraulic drive unit is complex and he would search for a possible alternative drive unit. In consultation with the person skilled in the practical aspects of control he would become aware of D15.

- 4.1 D15 relates to an electrically operated linear actuator. Under the heading "Background of the invention" D15 explains that computer control of hydraulic cylinders is achievable but involves substantial complexity whereas it is relatively simply achievable for electric motors. After stating that the use of an electric motor to generate hydraulic power is inefficient it goes on to state that "the trend has been to directly link the rotating output shaft of an electric motor to a mechanical device which converts the rotational motion into reciprocal or linear motion." Following an analysis of some prior art relating to electrically driven actuators D15 goes on to propose such a device which, in particular, offers precise positioning control. Indeed, large sections of the description relate to the application of closed-loop control to the operation of the actuator. The only application of such an actuator which is disclosed in D15 relates to the drive of a volumetric pump.
- 4.2 The introductory teaching of D15 regarding the general trend to replace hydraulic actuators by electrically operated actuators and the detailed disclosure regarding provision for closed-loop control would encourage the skilled person to employ an electrically operated actuator in order to facilitate his efforts to follow the teaching of D11. If the specifications of the particular actuator disclosed in D15 were not appropriate for operating a punch-riveting machine the skilled person would simply adapt the actuator according to his needs. There is nothing in either the specification of the contested patent or in the disclosure of D15 which indicates that such adaptation would not be wholly within the normal ability of the

skilled person. Indeed, the patent specification is totally silent regarding the specification of the actuator.

- 4.3 The board cannot agree with the respondent's argument that D11 is a complete teaching which leaves the skilled person without need to seek improvement. D11 explicitly states that closed-loop control offers potential for future development, thereby encouraging the skilled person to implement it in the best way possible. D11 is an overview of the punch-riveting process and, contrary to the respondent's view, does not propose implementing closed-loop control specifically with a hydraulic actuator. The disclosure of a hydraulic actuator is merely as part of a machine exemplifying the sensors used in connection with open-loop control for quality assessment. Closed-loop control, on the other hand, is discussed in the context of future developments to improve quality assurance. The board also cannot agree with the respondent's views concerning the need for development of the actuator according to D15. There is nothing to indicate to the skilled person that an actuator as disclosed in D15 would not be suitable for his purpose. The contested patent contains no details of any special requirements regarding the size or form of the actuator. This is true particularly in respect of the condition encountered in operating a punch-riveting machine, to which the respondent refers, of blocking the movement of the actuator. Moreover, it is implicit that the actuator's duty would vary greatly in dependence on the type and thickness of material to be joined. Even if an actuator according to D15 would not be immediately suitable for the particular application and so would

require development there is no evidence that this would extend beyond the general technical ability of the skilled person.

- 4.4 On the basis of the foregoing the board concludes that the subject-matter of present claim 1 does not involve an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:



A. Vottner



The Chairman:



S. Crane